SFG3930

BANGLADESH: RURAL ELECTRIFICATION AND RENEWABLE ENERGY DEVELOPMENT PROJECT II (RERED II) And ADDITIONAL FINANCING

UPDATED

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

December, 2017

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The updated harmonized ESMF is applicable to the original RERED, RERED **II** along with both Additional Financing (AF-1 and AF-2) .

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
BERC	Bangladesh Energy Regulatory Commission
CFL	Compact Fluorescent Lamp
EA	Environmental Assessment
ECA	Environmental Conservation Act
EHS	Environment and Health Safety
ELIB	Efficient Lighting Initiatives of Bangladesh
EMP	Environmental Management Plan
EMS	Environmental Management system
ESMF	Environmental and Social Management Framework
GOB	Government of Bangladesh
IAF	International Accreditation Forum
IDA	International Development Association
IDA	International Development Association
IDCOL	Infrastructure Development Company Limited
IFC	International Finance Corporation
ISO	International Organization for Standardization
JICA	Japan International Cooperation Agency
kW	Kilowatt
MW	Mega-watt
NGO	Non-Governmental Organization
OHSAS	Occupational Health and Safety Standard
PO	Participating Organization
PPIDF	Public Private Infrastructure Development Facility
RAP	Resettlement Action Plan
REREDP	Rural Electrification and Renewable Energy Development Project
RERED-AF	Rural Electrification and Renewable Energy Development Project -Additional Financing
SHS	Solar Home Systems
SREDA	Sustainable Renewable Energy Development Authority
SPS	Safeguards Policy Statement
WB	World Bank

EXECUTIVE SUMMARY

The major objective of the Rural Electrification and Renewable Energy Development Project (REREDP) of Infrastructure Development Company Limited (IDCOL) is to increase access to clean energy in rural areas through renewable energy. It will support: (i) increased access to electricity in rural areas through renewable energy; (ii) large-scale dissemination of more efficient cook stoves and fuels for cooking; and (iii) improved technical and institutional efficiency in the power sector. The proposed additional financing (AF) will contribute towards increasing access to electricity in remote rural areas where grid electricity is not economically viable.

The Solar Home Systems (SHS) program of Bangladesh supported by the World Bank is emerging as a viable electrification option for lighting and other basic services in areas without grid access. SHS are being installed under the ongoing renewable energy project and the proposed RERED-II AF will continue this support. Further the commercial needs of the rural markets and small enterprises would be served by renewable energy-based mini-grids, under the Remote Area Power Supply Systems (RAPSS) Guidelines of 2007. Other options for increasing access to clean energy are being supported through the project that includes solar-irrigation pump, solar mini-grid, biogas and biomass based power projects and other options like micro-grids to ensure sustainable development.

The Environmental and Social Management Framework (ESMF) has been updated for the proposed additional financing. However, the updated harmonized ESMF is applicable to the original RERED, RERED II Project along with both Additional Financing (AF-1 and AF-2) No major changes are proposed except that the ESMF will now be applicable for only IDCOL as the efficient lighting component implemented by the Bangladesh Rural Electrification Board (BREB) in 2012. Also, the ESMF will be applicable for the whole renewable energy program of IDCOL incorporating the requirements of other major development partners including the Asian Development Bank (ADB), Japan International Co-operation Agency (JICA), GIZ and KfW. In addition, it is believed that the ESMF will be able to meet the basic environmental and social safeguards of GEF, GPOBA, USAID and DFID, which are also supporting the program.

It is assumed that mini-grid/micro-grid (solar based system) does not associate with air pollution during operation phase. The primary concerns related to environmental, health, and safety issues are associated with improper manufacturing, and disposal of expired lead-acid battery. The project components primarily deal with the solar panels and batteries[1]. The ESMF is required to identify the major environmental and social impacts and formulate required environmental and social management measures. IDCOL as well as all relevant development partners and stakeholders participating in REREDP have agreed to adopt this harmonised ESMF, which defines the environmental and social requirements needed for processing the financing of each sub-component. This ESMF is in compliance with all the applicable environmental and social legislation of the Government of Bangladesh (GOB). The project is designated as environmental Category B (partial assessment) according to OP/BP of the World Bank and only one

[1] With the efficient lighting component proposed to be dropped from the project, further deployment of CFLs will no longer be supported under the proejct.

environmental safeguard policy OP/BP 4.01 has been triggered.

The credit facility will not allow any land acquisition. In addition, it restricts the use of any type of public land. Land, whether made available via direct purchase, or leasing will be screened to ensure that no physical or economic displacement of communities/persons will take place. Private lands, which are disputed or have encroachments on them (informal settlers, non-titled entities) will not be used for the project. The Project will not allow any type of involuntary resettlement or adverse impacts to Indigenous People (IP). Therefore OP 4.12 has not been triggered for the project.

The sub-projects will be implemented by private sponsors/proponents with IDCOL being the financial intermediary. All sub-project products or services will be available to beneficiaries on a purely commercial basis through installments collected at various intervals as appropriate for the sub-projects. The provisions are exactly the same for all customers who are willing to purchase the services and/or products on a voluntary basis. Reaching as many customers as possible is in the best interest of the project proponents. No negative impacts are anticipated towards IPs. Although OP 4.10 has not been triggered for the project, all areas where IPs reside will be screened through a screening procedure using a survey questionnaire. The project proponent will duly consult and communicate with the local population in local languages in a culturally sensitive manner so that the product or service is described adequately and all terms and conditions are clearly understood by them, including warranty periods and provisions. This was the approach adopted in the previous phase of the project and that experience demonstrates that all IPs who were able to to purchase the products and services under this project.; no complaints regarding inclusion or any kind of discrimination were reported either to IDCOL or any of the project proponents. In fact, IP populations living in remote areas without access to electricity have benefited greatly from the SHS and biogas subprojects (mini-grids and ICS have not been introduced in IP areas as yet; only 1 mini-grid has been installed so far at Swandip and the ICS is in the process of being launched). In case of implementing all sub-projects in IP prone area, IDCOL will also follow this approach in order to tailor the awareness raising, mobilization and training campaigns to the needs of IPs in the relevant locations so, that the statutory rights and privileges of the IP, as well as their customs and norms are adequately complied with. All awareness raising, mobilization and training campaigns will be tailored to the needs of IPs in the relevant locations. For this purpose, a brief social assessment will be carried out.

Legislative bases for Environmental Impact Assessment (EIA) in Bangladesh are the Environmental Conservation Act 1995 (ECA'95) and the Environmental Conservation Rules 1997 (ECR'97). Department of Environment (DOE), under the Ministry of Environment and Forest (MOEF), is the regulatory body responsible for enforcing the ECA'95 and ECR'97. Other law of Bangladesh like Renewable Energy Policy of Bangladesh (2008), Bangladesh Labor Law (2006), etc. will be obliged for the project. The ESMF will also be guided by the World Bank's Safeguards (Relevant Policies) mainly OP 4.01 Environmental Assessment, ADB's Safeguards Policy Statement (SPS)

2009 and other related operational manual (OM Section F1/BP) will be triggered for this project.

The major anticipated negative environmental impacts of this project are:

- Improper disposal and recycling of lead acid storage batteries, as causes for lead sulfate contamination in the surrounding lands and water bodies. Lead sulfate is a water soluble substance that could contaminate groundwater. Lead sulfide dust or lead concentrate gaseous substance enter the body of living beings through the nose and/or mouth through breathing. Very fine dust particles penetrates into the lungs and affect the human body and other animals;
- Improper disposal of PV panels will be a concern when the program supported panels start to reach the end of their useful lives of 20 years (the program started in 2003 with majority of the solar home systems being installed after 2008). Lead leaching is primarily linked to 1st generation crystalline silicon PV panels and Cadmium leaching is a risk associated with 2nd generation thin film panels. In addition, glass and aluminium are also common features in most of the PV panels resulting various types of environmental and health risks;
- Improper disposal of slurry and ground salinity may appear as matter of concern for biogas and solar-irrigation projects respectively;
- There is possibility of public health hazards due to improper disposal of CFL bulbs as there are mercury in the CFL bulbs. A national disposal guideline was prepared to ensure safe disposal of CFLs throughout the country even though the proposed CFLs component was dropped from the project.

The following are the major progress achieved under the ongoing RERED II project:

- There are 14 en-listed battery suppliers in IDCOL SHS program, who have fully completed the ISO 14001:2004 (Environmental Management Standard) and OHSAS 18001:2007 (Occupational Health Safety Standard) certification process. Out of these 14 battery suppliers, only 4 have their own recycling plants while the rest have entered into arrangements with the existing 4 recycling plants to use their facilities. Given the growth of the program, the existing recycling capacity will become inadequate in the near future; all the existing manufacturers need to have their own recycling plants. IDCOL will take initiative to require the existing suppliers irrespective of local manufacturers or importers to set-up their own recycling plants by June 30, 2016.
- For the CFL component, an international consultant was hired to develop a national guideline for the proper disposal of lamps and ensure safe collection of waste CFL bulbs.
- Audit Consultants (Environment Audit specialist and Mechanical Engineering Specialist) are being hired for undertaking an environment audit to assess the adequacy of the current mechanism for ensuring proper recycling of batteries.

As mentioned before, the purpose of this ESMF is to identify the likely environmental and social impacts, propose suitable mitigation measures and implementation of these measures. Mini-grids, micro-grids, biogas and biomass based captive plants, and solar

irrigation pumps need an environmental and social screening/assessment with management plan. No site specific environmental assessment will be required for household systems (solar home system, biogas digesters, improved cookstoves (ICS), CFLs, etc.). The measures under the ESMF include:

- Prepare guidelines for selecting new PV Panel and battery supplier;
- Provide technical guidance to environmental improvement on battery and CFL recycling support;
- Arrange hands-on training and awareness programs for POs on EHS aspects;
- Assign the IDCOL's Solar Inspectors to monitor the distribution of new battery as well as collection of expired battery;
- Strengthen IDCOL's capacity for environmental and social safeguard management;
- Ensure regular monitoring of battery manufacturing and recycling plants;
- Ensure proper awareness and arrangement to mitigate the environmental and health hazard due to improper management and disposal of CFL bulbs;
- Disclose this harmonized ESMF in the website of IDCOL as well as all relevant stakeholders;
- Disclose the summary of the ESMF in Bengali in IDCOL website.

IDCOL has already gained considerable experience in complying with the environmental and social safeguards of the DOE, WB and ADB. IDCOL has established the Environment and Social Safeguards Management Unit (ESMU) in their regular organogram to institutionalize the environmental and social management in its operation.

I. INTRODUCTION

1.1 BACKGROUND OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

1. The major objective of the Rural Electrification and Renewable Energy Development Project (REREDP) of Infrastructure Development Company Limited (IDCOL) is to increase access to clean energy in rural areas through renewable energy. It will support: (i) increased access to electricity in rural areas through renewable energy; (ii) large-scale dissemination of more efficient cook stoves and fuels for cooking; and (iii) improved technical and institutional efficiency in the power sector.
2. The proposed RERED-AF-2 will not be introducing any new type of activities. It is planned to be implemented nationwide, and will support improved cook stoves (ICS) as clean cooking option for households, solar irrigation pumps (SIP) and solar PV based mini grid projects (SMG), as same as the parent project.
3. No significant and/or irreversible adverse environmental and social impacts are anticipated. The project is designated as environmental Category B according to the WB safeguard policy; OP 4.01 and OP4.10 have been triggered as they were for the parent project. The AF-2 will follow the same ESMF (updated in April, 2014) which is in application for the ongoing project since overall safeguard requirements are assessed to be satisfactorily complied. A Gender Assessment was carried out for the project, with particular focus on the cook stoves component; the report showed very good outcomes and positive outcomes for overall wellbeing of women using the stoves.
4. The renewable energy program is being implemented by the Infrastructure Development Company Limited (IDCOL). It is expected that these interventions yield net positive environmental impacts. No significant and/or irreversible adverse environmental and social issues are expected but obviously, these interventions bear some environmental risk. The primary environmental, health, and safety issues involve how they are manufactured, installed, and ultimately disposed of. Proper consideration of all environmental and social factors during design and implementation is of utmost concern. An environmental management and social management framework (ESMF) was adopted under the original RERED project, which was updated during the two additional financings of the RERED-AF-2 project. The ESMF has been further reviewed and revised for the RERED II-AF Project. This updated ESMF is based on the assessment report of the existing ESMF implementation and is aimed towards a harmonized ESMF applicable for the renewable energy program of IDCOL supported by different development partners including the World Bank, Asian Development Bank, Japan International Cooperation Agency (JICA), German KfW, GIZ etc. The updated harmonized ESMF is applicable to the original RERED, RERED II Project along with both Additional Financing (AF-1 and AF-2)

5. Success in Solar Home Systems (SHS) program of Bangladesh supported by World Bank encouraged IDCOL to take initiative for promoting other renewable energy technologies like solar irrigation pumps (SIP), solar mini-grid (SMG) projects and clean cooking option for households through improved cook stoves (ICS), which are also getting success and need to go further. Up to 30 November, 2017 about 1.38 million ICS, one thousand SIP and 25 SMG were implemented under IDCOL's renewable energy activities. IDCOL has set a target in respect of various sub-project components as is mentioned in the following Table **01**.

Table 01: Targets of IDCOL's REREDP-AF 2

Project/Program	Target (number with year)
Improved Cook Stove Program (ICS)	5 million by 2021
Solar Irrigation Program (SIP)	3,000 by 2021
Solar Mini Grid (SMG)	70 by 2021

6. It is expected that the components under the REREDP interventions yield positive environmental impacts. But obviously, these interventions bear some environmental and health safety risks. The primary environmental, health, and safety issues involve how they are manufactured, installed, and ultimately disposed of. So, proper consideration of all environmental and social factors during design and implementation is of utmost concern. As a result, there is necessity of an environmental and social management framework (ESMF) by describing the potential environmental and social impacts and their feasible mitigation measures.

7. This ESMF is required for the RERED-AF2 to identify the required environmental management measures that need to be taken, in order to ensure compliance with the Government of Bangladesh own requirements and those of the World Bank (WB) and other development partners. All the major environmental impacts along with mitigation and management measures have been compiled in the form of ESMF.

8. The ESMF is being updated for the proposed additional financing AF 2. No major changes are proposed except that the ESMF will now be applicable for only IDCOL as the efficient lighting component implemented by the Bangladesh Rural Electrification Board (BREB) is discontinued. However, based on the experience and lesson learnt from RERED II AF, the ESMF is further updated monitoring and screening format are included in the annexures. Also, the ESMF will be applicable for the whole renewable energy program of IDCOL incorporating the requirements of all the different development partners supporting the program.

9. Consequently, this harmonized ESMF has been prepared, which is adopted by IDCOL to ensure the relevant safeguards policy of associated development partners including the World Bank (WB), Asian Development Bank (ADB), Japan International Co-operation Agency (JICA) and KfW. In addition, the relevant environmental, social and occupational health safety compliances of Bangladesh government have been complied with. So, it can be concluded that this ESMF is capable enough to meet the

major environmental, social and occupational health safety compliances of other supporting development partners including DFID, USAID and so on.

II. BRIEF PROJECT DESCRIPTION

2.1 WORLD BANK PROJECT

Rural Electrification and Renewable Energy Development Project- II (REREDP-II)

2.1.1 Component A: Solar Home Systems (SHS) Component

10. Through the Component A of Rural Electrification and Renewable Energy Development Project-II (REREDP-II), the WB would further scale up support to the Solar Home Systems (SHS) program of Bangladesh for providing access to electricity to households and shops in rural areas where grid electricity has not been reached yet. Customers are expected to provide 10%-15% of the SHS prices as down payment. The WB administered IDA funds (and IDCOL own funds) will refinance 60%-70% of the micro-finance extended by the POs to the households.

2.1.2 Component B: Remote Area Power Supply Systems (RAPSS)

11. Component B of REREDP-II includes the support to various technologies (mini-grid, micro-grid, solar irrigation pumps, biogas and biomass based captive plants etc) to meet the electricity needs of rural household, enterprises, and businesses that could not otherwise be met with SHS. The implementation activities, including selecting the sponsors for establishing, operating, and maintaining the various sub-projects would be undertaken by IDCOL. For mini-grids, sponsor equity will be a minimum of 20% with IDCOL providing the balance funds (including credit and capital buy-down grant to keep the end-user tariff affordable) to the mini-grid schemes building on the lessons learned from the pilots under already completed REREDP. The least cost technology options (solar PV, biomass gasification, etc.) will be used depending on the resource availability in the specific locations of the mini-grids. The component would also support biogas based captive plants to supply electricity in rural areas. Depending on demand and viability of the sub-projects, the component can support financing other applications such as solar cooling and drying or advanced hybrid brick kilns. The project sponsor will be required to either possess his own land or have valid lease documents. No land acquisition is allowed under the project. All land will be screened to ensure that no displacement of people (with or without title) will take place. IDCOL has followed this approach in the previous phase of the project and the social safeguards assessment shows that no displacement has taken place under the project (neither physical nor economic).

12. The component will also support solar irrigation pumps that would replace diesel-operated pumps thus contributing to increased access to clean energy by farmers. Similar to the mini-grid schemes, private sponsors would identify locations and reach agreements with groups of farmers on the selling rate for water and on the duration and quantity of water supply. IDCOL will ensure via screening of the farmer groups that in areas where IP populations reside side by side with mainstream populations there is adequate representation of IPs in farmer groups and the awareness raising, mobilization and training campaigns are tailored to the needs of IPs in the relevant locations. IDCOL performs regular monitoring of project areas and beneficiaries through a well-planned and implemented procedure. Sponsors will be putting in equity of at least 20%, while the rest of the project cost will be financed through a combination of credit and grant to keep

the tariff affordable to farmers. IDCOL will do site specific due diligence before approving the sub-projects.

2.1.3 Component C: Technical Assistance to IDCOL

13. This component would support IDCOL and the POs/sponsors in implementation, monitoring and evaluation of SHS and renewable energy investments to ensure effective implementation of Components A and B. The monitoring is to ensure that: (a) funds are being used for the intended purpose; (b) the POs/sponsors comply with established technical, after-sales service, and consumer protection standards; (c) customers are satisfied with the services; and (d) hazardous wastes such as used batteries are safely recycled. TA-supported activities would include IDCOL inspections and monitoring activities, technical performance audits of PV systems and components, procurement audit, third party monitoring, piloting of new and improved solar products including LED lamps, etc.

2.1.4 Component D: Household Energy Component

14. The proposed household energy component supports the efforts of various NGOs in providing rural households with clean cooking solutions. The strategic approach of this component includes: (i) awareness raising through social mobilization to ensure potential users are aware of the fuel saving and health benefits associated with clean cooking; (ii) research and development to enhance product quality, performance, safety and durability; (iii) setting up of performance standards, labels and testing facilities; and (iv) support to selected partner organizations to generate demand and to facilitate enterprise creation. The target is to commercially disseminate about 1 million improved cook stoves and 45,000 biogas units within the implementation period of the Project. Implemented by IDCOL, the component will build on the success of Bangladeshi NGOs in the areas of community outreach in total sanitation programs. It will also build on the earlier work undertaken by local institutions in the areas of stove design and reduction of emission of toxic pollutants from incomplete combustion of wood fuels. The implementation of this component will be in close collaboration with on-going activities in the sector by NGOs, GIZ, USAID and upcoming activities that will be undertaken through the Global Alliance of Clean Cook stoves. In IP areas sponsors will conduct the consultation and communication with local communities in the local languages in a culturally appropriate manner and will ensure that relevant feedback is duly incorporated in the delivery of services and products.

2.1.5 Additional financing RERED II-AF 2

15. In this context, the additional financing is required to scale up the RERED II Access to Electricity component to support the installation of 1,000 solar irrigation pumps (SIP) and 30 solar mini-grids (SMG), and the Household Energy component to support an additional 4 million Improved Cook Stoves (ICS) in rural areas of Bangladesh. Of the proposed additional IDA credit, would be allocated for the Access to Electricity component for investments in private sector SIPs that displace diesel irrigation pumps, and in SMGs installed primarily on islands that will not be connected to the national grid to offset diesel-powered mini-grids. The proposed additional fund to the Household Energy component is primarily aimed at supporting the continued growth of the ICS program which has emerged as a viable model for increasing efficiency of fuel use for cooking. It will reduce indoor air pollution and

improve health, cut GHG emissions, and lower households' cost of cooking.

2.2 ASIAN DEVELOPMENT BANK PROJECT

Public Private Infrastructure Development Facility-II (PPIDF-II)

2.2.1 Component 1: Increased Available Long-term Debt Financing for Infrastructure Projects

16. The output will be achieved through component 1 which will provide IDCOL with local currency or $ funding in the amount of up to $100 million equivalent.

17. The proceeds from this Project component will be used to finance private sector-sponsored medium and large infrastructure projects (SMIPs) in Bangladesh with an individual project size of at least $10 million.

2.2.2 Component 2: Increased Availability and Accessibility of Financing for SHS

18. The output will be achieved through component 2, which will provide IDCOL with a credit line of $10 million in local currency equivalent for its SHS program. IDCOL's SHS program is a demand-driven model for increasing access to electricity in remote rural areas where grid connection is not economically feasible or would take a long time to reach. It is to be noted that through the lending facility of PPIDF-I, 321,164 SHS have been installed throughout the country.

19. IDCOL's SHS program provides refinancing, sets technical specifications for equipment, develops publicity materials, extends loans, installs the systems, monitors their performance, and provides maintenance support. In particular, IDCOL provides loans at an approximate interest rate of 6%–9% (per annum) with a tenor of 5–7 years and a grace period of up to 1 year to participating organizations (POs), which then provide customers in rural areas with financing of up to 80% of the cost of an SHS with a capacity of 10 watts–130 watts.

20. Funds used by IDCOL for refinancing stem exclusively from donor loans channeled through the Government. IDCOL's main responsibility is, therefore, to raise and channel funding in the form of loans to POs and to monitor the overall performance of its SHS program. POs, in a second step, will then select subproject areas and potential customers, extend loans, install the systems, monitor their performance, and provide maintenance support. In addition to the refinancing arrangement, donors devised a grant scheme to incentivize IDCOL and its POs to increase the affordability of these renewable energy applications to buyers in rural off-grid areas, where the poorer section of the population normally lives. The prices of SHSs depend not only on the institutional capacity of IDCOL and its POs in operating cost efficiently but also on world prices for the various system components that are subject to demand and supply. Thus, the grant scheme will shelter end-users from some of the price fluctuations as well as accelerate use of the program.

21. The main rationale for component 2 is to increase the financing available to the rural poor for the purchase of an SHS which is in line with the provision of funds already

provided by other donors. The funds will increase SHS installation rates and the successful implementation of alternative energy generation in off-grid areas. This will assist the Government in implementing its vision of universal electricity access by 2020.

2.3 JAPAN INTERNATIONAL COOPERATION AGENCY PROJECT

Renewable Energy Development Project

2.3.1 Components of Renewable Energy Development Project (REDP)

22. There are three components of JICAS's Renewable Energy Development Project. The Component 1 includes Provision of Funds to POs/Sponsors in establishing 575,469 SHS, 1,200 solar pumps for irrigation, 29 mini-grids, 20 biomass gasification plant and 60 biogas based power generation plants. The Component 2 and 3 include Implementation Support and Consulting Services. The amount of total fund under REDP is about 11,335 million Japanese Yen.

2.4 COMPONENTS OF KfW THROUGH RENEWABLE ENERGY DEVELOPMENT PROJECT

2.4.1 Components of Renewable Energy Development Project (REDP)

23. Having contributed financing for 440,000 SHS, KfW is currently providing support to IDCOL Biogas and other renewable energy projects including (solar mini-grid, solar irrigation pump, biomass and biogas based power plant etc) with funds from German Financial Cooperation. Altogether, German Financial Cooperation has already provided 5 million USD as credit support and 26 million USD as grant support via KfW to IDCOL. In addition, it is considering about 14 million USD as grant support to other renewable energy projects.

III. RELEVANT POLICY, ACT AND RULE

3.1 GENERAL

24. Legislative bases for Environmental Impact Assessment (EIA) in Bangladesh are the Environmental Conservation Act 1995 (ECA'95) and the Environmental Conservation Rules 1997 (ECR'97). Department of Environment (DOE), under the Ministry of Environment and Forests (MOEF) is the regulatory body responsible for enforcing the ECA'95 and ECR'97. It is the responsibility of the proponent to conduct an Environmental Assessment (EA) of development proposal and the responsibility to review EIAs for the purpose of issuing Environmental Clearance Certificate (ECC) rests on the DOE.

3.2 BANGLADESH ENVIRONMENTAL CONSERVATION ACT (ECA), 1995

25. The Environmental Conservation Act (ECA) of 1995 is the main legislative framework document relating to environmental protection in Bangladesh. This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. This Act established the DOE, and empowers its Director General to take measures as he considers necessary which includes conducting inquiries, preventing probable accidents, advising the Government, coordinating with other authorities or agencies, and collecting & publishing information about environmental pollution. According to this act (Section 12), no industrial unit or project shall be established or undertaken without obtaining, in a manner prescribed by the accompanying Rules, an (ECC) from the Director General of the DOE.

26. The Act was amended in 2006 (SRO No. 175-Act/2006 dated August 29, 2006) on collection and recycling of used/non-functional batteries for conservation of environment, improving environmental standard and control and prevention of environmental pollution. According to this amendment, no recycling of battery will be permitted without environmental clearance of DOE. This also restricted the improper disposal of used batteries or any parts of used battery in open place, water bodies, waste bins, etc. All used batteries must be sent to the DOE approved battery recycling industry at earliest convenience. No financial transaction was allowed for used/non-functional batteries. However, the act was amended on same issue again in 2008 (SRO No. 29-Act/2008 dated February 11, 2008) to allow financial transaction on mutually agreed fixed cost.

3.3 BANGLADESH ENVIRONMENTAL CONSERVATION RULES (ECR), 1997

27. The Environment Conservation Rules, 1997 were issued by the Government of Bangladesh in exercise of the power conferred under the Environment Conservation Act (Section 20), 1995. Under these Rules, the following aspects, among others, are covered:

- Declaration of ecologically critical areas;
- Classification of industries and projects into four categories;
- Procedures for issuing the Environmental Clearance Certificate;

- Determination of environmental standards;

28. The Rule 3 defines the factors to be considered in declaring an area 'ecologically critical area' (ECA) as per Section 5 of ECA'95. It empowers the Government to declare an area 'ECA', if it is satisfied that the ecosystem of the area has reached or is threatened to reach a critical state or condition due to environmental degradation. The Government is also empowered to specify which of the operations or processes shall be carried out or shall not be initiated in the ecologically critical area. Under this mandate, MOEF has declared Sundarban, Cox's Bazar-Tekhnaf Sea Shore, Saint Martin Island, Sonadia Island, Hakaluki Haor, Tanguar Haor, Marzat Baor and Gulshan-Baridhara Lake as ecologically critical areas and prohibited certain activities in those areas.

29. ECR'97 (Rule 7) classifies industrial units and projects into four categories depending on environmental impact and location for the purpose of issuance of ECC as are:

- Green
- Orange A
- Orange B, and
- Red

30. All existing industrial units and projects and proposed industrial units and projects, that are considered to be low polluting are categorized under "Green" and shall be granted Environmental Clearance. For proposed industrial units and projects falling in the Orange- A, Orange- B and Red Categories, firstly a site clearance certificate and thereafter an environmental clearance certificate will be issued. A detailed description of those four categories of industries has been given in Schedule-1 of ECR'97.

31. Apart from general requirement, for every Orange-B and Red category proposed industrial unit or project; the application must be accompanied with feasibility report on Initial Environmental Examination (IEE), Environmental Impact Assessment (EIA) based on approved TOR by DOE, Environmental Management Plan (EMP) along with lay-out plan (showing location of ETP), time schedule of ETP, etc.

32. The ECR'97 also contains the procedures for obtaining Environmental Clearance Certificates (ECC) from the Department of Environment for different types of proposed units or projects. Any person or organization wishing to establish an industrial unit or project must obtain ECC from the Director General. The application for such certificate must be in the prescribed form together with the prescribed fees laid down in Schedule 13, through the deposit of a Treasury Chalan in favor of the Director General. Rule 8 prescribes the duration of validity of such certificate (3 years from green category and 1 year for other categories) and compulsory requirement renewal of certificate at least 30 days before expiry of its validity.

33. There is no clear and specific guidance about application of renewable energy technologies and energy efficient CFL bulb project in both ECA'95 and ECR'97.

3.4 ENVIRONMENTAL CONSERVATION ACT (AMENDMENT 2010)

34. This amendment of the act introduces new rules and restriction on:

- ensure proper management of hazardous wastes to prevent environmental pollution and health risk
- No remarked water body cannot be filled up/changed; in case of national interest; it can be done after getting clearance from the respective department; and
- Emitter of any activities/incident will be bound to control emission of environmental pollutants that exceeds the existing emission standards

3.5 RENEWABLE ENERGY POLICY OF BANGLADESH, 2008

35. The renewable energy policy of Bangladesh has been approved on December 18, 2008 with the target of developing renewable energy resources. This Policy laid out the target of meeting 5% of total power demand from renewable energy sources by 2015 and 10% by 2020. The policy provides an overall guidance of

- institutional arrangements
- resource, technology and program development
- investment and fiscal incentives
- regulatory policy

36. The policy promotes appropriate, efficient and environment friendly use of renewable energy. It also suggests that for large biomass electricity projects (i.e., greater than 1 MW) the project developer must demonstrate that the biomass is being sustainably harvested and that no adverse social impact will result from that development. It also restricted the larger scale production and use of bio-fuels which may jeopardize the existing crops.

3.6 REMOTE AREA POWER SUPPLY SYSTEMS (RAPSS) GUIDELINE, 2007

37. The Remote Area Power Supply Systems (RAPSS) guideline of 2007 allows for private sector participation in development, operation, and maintenance of electricity generation system and distribution networks in remote rural areas including isolated islands to supplement GOB efforts at achieving universal access by 2020. However, there has not been much progress in implementing the RAPSS schemes. GOB is in the process to establish the Sustainable and Renewable Energy Development Agency (SREDA) as an autonomous body to lead its efforts in promoting renewable energy and energy efficiency in the country.

3.7 BANGLADESH LABOR LAW, 2006

38. This Act pertains to the occupational rights and safety of factory workers and the provision of a comfortable work environment and reasonable working conditions. In the chapter VI of this law safety precaution regarding explosive or inflammable dust/ gas, protection of eyes, protection against fire, works with cranes and other lifting machinery,

lifting of excessive weights are described. And in the Chapter VIII provision safety measure like as appliances of first –aid, maintenance of safety record book, rooms for children, housing facilities, medical care, group insurance, etc. are illustrated.

3.8 WORLD BANK'S SAFEGUARDS (RELEVANT POLICIES)

OP 4.01 Environmental Assessment

39. The Bank requires environmental assessment (EA) of projects proposed for Bank support to ensure that they are environmentally sound and sustainable, and thus to improve decision making. EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. EA takes into account the natural environment (air, water and land); human health and safety; social aspects (involuntary resettlement, tribal peoples and physical cultural resources); and trans-boundary and global environmental aspects. The borrower is responsible for carrying out the EA and the Bank advises the bower on the Bank's EA requirements.

40. The Bank classifies the proposed project into three major categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

Category A: The proposed project 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.

Category B: The proposed project's potential adverse environmental impacts on human population or environmentally important areas-including wetlands, forests, grasslands, or 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 mitigation measures can be designed more readily than Category A projects.

Category C: The proposed project is likely to have minimal or no adverse environmental impacts.

OP 4.04 on Natural Habitats

41. The conservation of natural habitats, like other measures that protect and enhance the environment, is essential for long-term sustainable development. The Bank therefore supports the protection, maintenance, and rehabilitation of natural habitats and their functions in its economic and sector work, project financing, and policy dialogue. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development. The Bank promotes and supports natural habitat conservation and improved land use by financing projects designed to integrate into national and regional

development the conservation of natural habitats and the maintenance of ecological functions. Furthermore, the Bank promotes the rehabilitation of degraded natural habitats. The Bank does not support projects that involve the significant conversion or degradation of critical natural habitats.

42. Of the two environmental safeguard policies that are relevant to this project, only OP 4.01 on Environmental Assessment is triggered in case of RERED additional financing.

OP 4.10 - Indigenous Peoples

43. This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Tribal Peoples. For all projects that are proposed for Bank financing and affect Tribal Peoples, the Bank requires the borrower to engage in a process of free, prior, and informed consultation. The Bank provides project financing only where free, prior, and informed consultation results in broad community support to the project by the affected Tribal Peoples. Such Bank-financed projects include measures to (a) avoid potentially adverse effects on the Tribal Peoples' communities; or (b) when avoidance is not feasible, minimize, mitigate, or compensate for such effects. Bank-financed projects are also designed to ensure that the Tribal Peoples receive social and economic benefits that are culturally appropriate and gender and inter-generationally inclusive.

44. The Bank recognizes that the identities and cultures of Tribal Peoples are inextricably linked to the lands on which they live and the natural resources on which they depend. These distinct circumstances expose Tribal Peoples to different types of risks and levels of impacts from development projects, including loss of identity, culture, and customary livelihoods, as well as exposure to disease. Gender and intergenerational issues among Tribal Peoples also are complex. As social groups with identities that are often distinct from dominant groups in their national societies, Tribal Peoples are frequently among the most marginalized and vulnerable segments of the population. As a result, their economic, social, and legal status often limits their capacity to defend their interests in and rights to lands, territories, and other productive resources, and/or restricts their ability to participate in and benefit from development. At the same time, the Bank recognizes that Tribal Peoples play a vital role in sustainable development and that their rights are increasingly being addressed under both domestic and international law.

OP 4.12 - Involuntary Resettlement

45. Bank's experience indicates that involuntary resettlement under development projects, if unmitigated, often gives rise to severe economic, social, and environmental risks: production systems are dismantled; people face impoverishment when their productive assets or income sources are lost; people are relocated to environments where their productive skills may be less applicable and the competition for resources greater; community institutions and social networks are weakened; kin groups are dispersed; and cultural identity, traditional authority, and the potential for mutual help are diminished or lost. This policy includes safeguards to address and mitigate these impoverishment risks.

46. Implication of WB Policy: In view of subprojects nature, the overall AF is classified as a Category 'B' as applied in the original project and the safeguard policy OP/BP 4.01 has been triggered to ensure that the sub project design and implementation is focused on reducing adverse impacts and enhancing positive impacts. The sub-projects will be reaching areas where Indigenous People (IP) live and therefore OP/BP4.10 has now been triggered in this updated ESMF. Availing of the services from the sub-projects will be purely on willing-buyer willing seller basis. The project has a screening process for IPs and has implemented a consultation and communication process in those areas that is consistent with OP 4.10. Project proponents and partner organizations are committed to be as inclusive as possible as this increases their customer base and raises their commercial viability. Sub-project specific environment and social screening, and if necessary impact assessments, will be undertaken and appropriate mitigation plans to be prepared before the sub-project financing are consider under the RAPSS component. IDCOL will review each screening/assessment and will regularly monitor the implementation of environment and social management plan.

3.9 JICA GUIDELINES ON ENVIRONMENTAL AND SOCIAL SAFEGUARDS

47. JICA has already started to provide lending support in IDCOL SHS program. So, relevant standards and policies on environmental and social safeguards are applicable to IDCOL SHS Program.

48. JICA has prepared "Guidelines for Environmental and Social Considerations, April 2010" as the referential guidelines for environmental and social considerations. The objectives of the guidelines are to encourage Project proponents etc. to have appropriate consideration for environmental and social impacts, as well as to ensure that JICA's support for and examination of environmental and social considerations are conducted accordingly. The guidelines outline JICA's responsibilities and procedures, along with its requirements for project proponents etc., in order to facilitate the achievement of these objectives. In doing so, JICA endeavors to ensure transparency, predictability, and accountability in its support by considering environmental and social issues.

49. According to the guidelines, JICA classifies development projects into four categories with regards to the extent of environmental and social impacts, and taking into account the outlines, scale, site and other conditions. The four categories are as follows:

Category A. Proposed projects are likely to have significant adverse impacts on the environment and society.

Category B. Proposed projects are classified as Category B if their potential adverse impacts on the environment and society are less adverse than those of Category A projects.

Category C. Proposed projects are classified as Category C if they are likely to have minimal or little adverse impact on the environment and society.

Category FI. A proposed project is classified as Category FI if it satisfies all of the followings:

- JICA's funding of the project is provided to a financial intermediary or executing agency such as IDCOL;
- The selection and appraisal of the components is substantially undertaken by such an institution only after JICA's approval of the funding, so that the components cannot be specified prior to JICA's approval of funding (or project appraisal); and
- Those components are expected to have a potential impact on the environment

50. Over a certain period of time, JICA confirms with project proponents etc. the results of monitoring the items that have significant environmental impacts. This is done in order to confirm that project proponents etc. are undertaking environmental and social considerations for projects that fall under Categories A, B, and FI.

3.10 ADB GUIDELINES ON ENVIRONMENTAL AND SOCIAL SAFEGUARDS

51. ADB's Safeguards Policy Statement (SPS) 2009, consolidated its previous policy on the environment (2002), involuntary resettlement (1995) and indigenous peoples (1998). These are accompanied by Operations Manual sections on Environmental Considerations in ADB Operations (OM Section F1); Involuntary Resettlement (OM Section F2); and Indigenous Peoples (OM Section F3). The goal of SPS is to promote the sustainability of project outcomes by protecting the environment and people from potential adverse impacts of projects. ADB finances projects that comply with its SPS and host country's social and environmental laws and regulations, including international law the host country is obligated to implement.

52. The SPS, 2009 clearly spells out the ADB's commitment on sustainable development. It has described the required environmental and social compliance measures in detail. Major requirement of SPS includes (i) impacts are identified and assessed early in the project cycle; (ii) plans to avoid, minimize, mitigate, or compensate for the potential adverse impacts are developed and implemented; and (iii) affected people are informed and consulted during project preparation and implementation. ADB adopted a new accountability mechanism in 2003, whereby people adversely affected by ADB-financed projects can express their grievances; seek solutions; and report alleged violations of ADB's operational policies and procedures, including safeguard policies.

53. According to SPS, 2009, ADB carries out project screening and categorization at the earliest stage of project preparation when sufficient information is available for this purpose. Screening and categorization are undertaken to (i) reflect the significance of potential impacts or risks that a project might present; (ii) identify the level of assessment and institutional resources required for the safeguard measures; and (iii) determine disclosure requirements.

54. ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its

type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Projects are assigned to one of the following four categories:

Category A. A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An EIA including an EMP is required.

Category B. A proposed project is classified as category B if its potential adverse environmental impacts 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 mitigation measures can be designed more readily than for category A projects. An IEE, including an EMP, is required.

Category C. A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. An EIA or IEE is not required, although environmental implications need to be reviewed.

Category FI. A proposed project is classified as category FI if it involves the investment of ADB funds to, or through, a financial intermediary. An appropriate Environment and Social Management System (ESMS) should be in place for FIs.

55. ADB will screen all projects to determine whether or not they involve involuntary resettlement. For a project involving involuntary resettlement, a resettlement plan will be prepared that is commensurate with the extent and degree of the impacts. The degree of impacts shall be determined by (i) the scope of physical and economic displacement, and (ii) the vulnerability of the affected persons.

56. ADB will screen all projects to determine whether or not they have potential impacts on Tribal Peoples. For projects with impacts on Tribal Peoples, an Tribal Peoples plan will be prepared. The plan's level of detail and comprehensiveness will be commensurate with the degree of impacts. The degree of impacts is determined by evaluating (i) the magnitude of the impact on Tribal Peoples' customary rights of use and access to land and natural resources; socioeconomic status; cultural and communal integrity; health, education, livelihood systems, and social security status; or tribal knowledge; and (ii) the vulnerability of the affected Tribal Peoples.

57. To deal with the safeguards requirement of small and medium infrastructure projects under PPIDF, IDCOL has already adopted an Environmental and Social Management Framework (ESMF), which has already been acknowledged by ADB. As the major focus of ESMF was to ensure the safeguards compliances for small and medium infrastructure projects, the ESMF has been adopted to ensure the required safeguards compliances in renewable energy projects in a comprehensive manner.

3.11 SUSTAINABILITY GUIDELINES OF KfW DEVELOPMENT BANK

58. For all projects implemented through KfW on behalf of German Financial Cooperation, it has to be ensured that they are compatible with environmental and other

crucial development standards. The objective of environmental and social impact assessments (ESIA) and climate change assessments is to anticipate and appraise any foreseeable impact a project may have on the environment, the climate and/or on social factors, and to identify and prevent any negative impact, or limit it to a tolerable level and (provided that the negative impact is inevitable but still tolerable) introduce compensation measures.

59. Similar to other donors, KfW appraises each new project at an early stage in order to determine its relevance in terms of environmental and social aspects and risks, as well as in terms of substantial greenhouse gas reduction potential and substantial need of adaptation to possible climate change. All projects will be classified into one of the following three categories A, B or C, according to the relevance of their potentially negative environmental and social impact.

60. Category A. Projects will be classified as category A, if they may have a severe negative impact on the environment and/or the social conditions of those concerned. A potentially severe negative impact means that the consequences are manifold, irreversible or unprecedented. Such consequences may affect a larger area beyond the site of the facility under construction, the site of the facility itself or the project area in a narrower sense. As a matter of principle, any projects that are considered sensitive must be classified as category A. For category A projects, it is mandatory to analyse and appraise any negative ecological and social consequences as part of an independent environmental and social impact study (ESIS) and to draw up an environmental and social management plan (ESMP).

61. Category B. Projects will be classified as category B, if they may have a potentially negative impact on the environment and on the social conditions of those concerned, which, however, is less severe than that of category A projects and can usually be mitigated through state-of-the-art countermeasures or standard solutions. Typically, the potential consequences of category B projects are limited to the local area, are in most cases reversible and are easier to mitigate through appropriate measures. For category B projects, the need for and the scope, priorities and depth of an ESIS have to be determined on a case-by-case basis.

62. Category C. Projects will be classified as category C if they are expected to have no or only minor negative environmental and social consequences and if the implementation and operation of the project does not require any particular protection, compensation or monitoring measures. Category C projects usually do not require any additional analysis within the meaning of this Guideline or any further ESIA procedures. However, category C projects should be monitored for any relevant changes over their life cycle.

63. By aligning ESIAs with internationally recognised environmental and social standards (e.g. World Bank Safeguard Policies, IFC Performance Standards, Environmental, Health and Safety Guidelines of the World Bank Group, ILO Core Labour Standards, EU Environmental Legislation), KfW Development Bank aims to improve donor harmonisation in accordance with the Paris Declaration.

IV. ENVIRONMENTAL ASSESSMENT

64. This ESMF has been developed by IDCOL specifically for the proposed operation to ensure due diligence, to avoid any environmental degradation issues for the project SHS component, and other renewable energy component including mini-grid, solar irrigation, biogas, improved cook stove and biogas and biomass gasification based power projects

4.1 ASSESSMENT OF FIRST PHASE PROJECT

65. The following major action has been undertaken under the existing ESMF of ongoing RERED, financed by the WB:

- IDCOL has appointed a full time Environmental Specialist in addition to the existing Specialist to take care the environmental and social safeguards. The new Specialist will join from May 1, 2014

- To ensure the compliance of safeguards more effectively, IDCOL has made ISO 14001:2004 (Environmental Management Standard) and OHSAS 18001:2007 (Occupational Health Safety Standard) compliances for all battery suppliers and expired battery recyclers. At present there are 14 battery suppliers and 4 recyclers who have complied with these requirements while the rest have entered into arrangements with the existing 4 recycling plants to use their facilities.

- IDCOL has developed the 'Policy Guidelines on Disposal of Warranty Expired Batteries' on June 14, 2005 for RERED project. Based on the guidelines, IDCOL facilitated an agreement between battery manufacturers and POs. According to the agreement, POs are responsible to notify the customers before 3 months of the warranty expiration date and advice customers to replace the battery. PO representatives are accountable to collect batteries from customers and to safely transport to regional locations of battery manufacturer. The manufacturer is responsible for collecting batteries from regional centers and to transport it to the site where the batteries will be recycled or disposed in an environment-friendly manner. The battery disposal issue has been discussed with POs in monthly operational meeting. An agreement copy is attached in Annex-7. For ensuring proper collection of expired battery IDCOL has introduced a format as is shown in Annex-6. Moreover, it has introduced a new clause in the Buy-back Agreement to be signed between PO and household. According to this clause, household shall not sell expired battery to any second party and such battery shall be returned to any of the IDCOL's POs or supplier of the battery.

- IDCOL quarterly monitors the Environment, Health and Safety (EHS) compliances of the three battery recycling plants.

- IDCOL arranges quarterly awareness raising training to the battery manufacturers and recyclers to enhance their awareness about the importance of EHS.
- IDCOL arranges quarterly meetings for the battery suppliers and recyclers where they have to present their quarterly EHS Compliance Report.

66. Annex 21 shows the detailed review of experience with implementation of the ESMF including a description of how used batteries have been recycled.

V. ENVIRONMENTAL AND SOCIAL IMPACTS

5.1 ANTICIPATED ENVIRONMENTAL AND SOCIAL IMPACTS

67. The project will support: (i) increase access to electricity in rural areas through renewable energy; (ii) support large-scale dissemination of more efficient cook stoves and fuels for cooking; and (iii) improve technical and institutional efficiency in the power sector. In case of SHS, SIP & SMG, there is an issue of Sulphur-di-oxide (SO2) emission and other gaseous substance during operation phase. Moreover, there is issue of significant emission of Lead oxide (PbO), Hydrogen sulfide (H2S) etc. gaseous substances during battery manufacturing and recycling process. Battery is used for mini-grid project, there is no air pollution during operation phase. But during recycling, there is risk of pollution. Ensuring proper disposal or recycling of expired and PV panel is also appearing as a prime requirement for EHS context.

68. Based on the experience and lesson learnt from the RERED-II project, the environmental and social activities & monitoring format been changed or modified based on the practical perspective view. For SMG project, IDCOL prepared a battery recycling agreement for the project sponsors and the battery suppliers, currently implemented for the projects (annexure 7a). Also, updated appraisal report format (annexure 1), the Environmental & Social appraisal report and terms of reference (ToR) for the ESIA report (annexure 10). For SIP project, IDCOL has also updated the EHS monitoring format and using in regular monitoring purpose (annexures 8B). For ICS program, IDCOL prepared an environmental & social field observation format (annexure 8C).

69. This ESMF identifies some of the key environmental impacts associated with these technologies and these are stipulated below.

- The chemicals typically used in PV module manufacturing are aluminum, hydrochloric acid, silicon, phosphine, etc. Materials used in some solar systems can create health and safety hazards for workers and anyone else coming into contact with them. Workers involved in manufacturing photovoltaic modules and components must consequently be protected from exposure to these materials, as well as proper disposal is required after expire of the efficiency of these panels.

- The SHS or mini-grid/micro-grid mainly comprises of Solar Modules and storage battery. Improper disposal and recycling of lead acid storage batteries result in lead sulfate contamination in lands and water bodies. Through percolation, lead sulfate can contaminate groundwater and transfer up the food chain. Lead can enter body in two ways: by breathing or by swallowing it. Lead Sulfide dust enters the body through breathing. Very fine lead particles may penetrate into the lungs result in absorption in the bloodstream. In addition, there is an impending threat for the workers due to the inhalation of lead fumes.

- Long exposure to lead pollution results in the adverse impact in nervous system and cause headaches, dizziness, irritability, memory problems, and disturbance in sleep. It can affect the digestive system and cause nausea, vomiting, constipation, appetite loss, and abdominal pain. Lead

also affects formation of blood and can result in anemia. Too much lead can also cause miscarriages and stillbirths when pregnant women are exposed to lead. In men, the sperm can be affected and this may result in infertility.

- The possibility of GHG emission during manufacturing, operation and recycling of lead-acid batteries could be a matter of concern. So, required measures need to be adopted to mitigate as well as compensate.

- Biomass power i.e., combustion of biomass and biomass-derived fuels may produce air pollution if not properly designed, constructed and operated. Advanced technologies with proper operation should generate much lower emissions.

- Improper disposal of CFL bulbs is significant concern due to adverse impact of mercury pollution. Elemental (metallic) mercury is toxic and exposure to excessive levels can permanently damage brain and kidneys. Being absorbed through skin, mercury compounds can cause severe renal and gastrointestinal damage. Organic compounds of mercury such as methyl mercury are considered the most toxic forms of the element. Exposures to very small amounts of organic compounds of mercury can result in devastating neurological damage and death.

- No land acquisition or displacement of people from public or private lands is permitted under the project. The IP areas will be screened to identify relevant communities and a culturally appropriate communication process (which has been in use during the previous phase of the project and has been assessed to yield good results) will be used to clearly describe the products and services as well as warranty issues and other provisions terms and conditions of payments etc. No adverse social impacts are expected. All products and services are available on a purely commercial basis to all paying customers regardless of ethnicity. There have been no reported cases of discrimination or exclusion as it is in the best interest of the project proponents to reach as many customers as possible.

- Customers, including IPs, have benefited greatly from the project especially IPs living in remote areas without access to electricity.

5.2 MITIGATION MEASURES

70. Through this ESMF it has been tried to identify the likely environmental and social impacts and determine suitable mitigation measures. For sub-projects of mini-grids and solar irrigation pumps need an environmental and social screening/assessment with management plan, during project implementation prior to approval for any sub-project as have been provided as Annex-8. No site specific environmental assessment will be required for household system (solar home system, biomass etc.). The requirement to carry out an environmental analysis as part of project preparation can be waived. However, following measures in the various components of RERED II will be undertaken under the ESMF.

5.2.1 Solar Home Systems (SHS) Component

71. Environment and occupational health & safety are major issues to the battery recycling and manufacturing under the program. All battery suppliers and expired battery recyclers are required to be ISO 14001:2004 and OHSAS: 18001:2007 certified. In addition to the above certification, IDCOL has to make sure the following measures in the battery industry for proper implementation of EMS and OHS through regular monitoring and compliance.

i. The industry will ensure appropriate work clothes and musk to the workers

- use coveralls, work boots, and a washable or disposable cap
- use full protection mask (not simple cotton nose musk) to avoid inhalation lead-containing furnace emissions
- remove work clothes before eating or smoking and before leaving work
- use a change area separate from the work area
- provide separate work and street clothes
- regular wash of working clothes

ii. The industry will promote personal hygiene practices of workers

- keep hands away from your lips and mouth
- avoid eating or smoking in the work area
- avoid rubbing sleeves on face
- always wash hands and face thoroughly with soap and water before breaks
- rinse mouth before eating or smoking

iii. The industry will adopt the following mitigation measures to improve environmental practices

- proper storage facilities of used batteries and its components at recycling factories
- use of mechanized process to dismantling the battery and its components
- neutralization of disposed acid by using sodium hydroxide (NaOH)/calcium carbonate ($CaCO_3$)
- use of cleaner fuel (natural gas, LPG etc.) instead of low-grade coal as fuel for smelting
- safe disposal of waste water from recycling plant

72. All battery manufacturers and recyclers need to be oriented with the advanced effluent treatment facility for proper disposal of sludge (Sulphuric acid and lead).

5.2.2 Remote Area Power Supply Component

73. Mini-grids/micro-grids would be on existing rights of way, which are largely rural roadways and the planning will be carried out jointly with the local community. Therefore, this mini-grid comprising small rural area will not create any potential adverse environmental impacts. Care will be taken to minimize deforestation in securing rights of way. Mini/micro grids based on solar PV require battery storage room and proper maintenance of these batteries. The project will promote the capacity development of local operator to maintain the system. An environmental impact assessment will be carried out and proper mitigation measures will be undertaken by the project proponent.

74. The concerns related to the small-scale wind energy projects results from noise impact and potential interference with bird migration pattern. Windmills make some noise, and the amount of noise increases with the speed of the sails/blades. Since the environmental impacts of small-scale windmills are not significant, environmental assessment will be included in the feasibility and design study of the windmills.

75. The biomass and biogas based electricity projects will be of small to medium scale (below 1 MW). These projects will be mostly captive type and if required, micro grid may need to be established. The following are the key environmental risks if the system is not properly designed, constructed, operated and maintained.

Effluent emission, On-site contamination, Hazardous materials issues

- Methane emissions from waste storage facility
- Contamination of surface and groundwater due to disposal of anaerobic digestion effluents- pathogens, particulate matter, COD/BOD
- Emission of nitrogen oxides, sulfur oxides, particulates, trace amounts of toxic materials, including dioxins due to biogas combustion
- Impacts due to waste storage: odor, visual intrusion, windblown litter, attraction of flies and rodents

Occupational Health and Safety issues

- Occupational accidents and health hazards due to methane emissions during waste storage and gas collection

76. For small-scale household level biomass and biogas project, no environmental assessment will be carried out. Only for commercial plants, detailed environmental assessment will be carried out and site specific environmental management plan will be prepared. In general, the following are the mitigation and enhancement measures to be taken for biomass and biogas based electricity project.

- Appropriate location of waste storage facilities (considering proximity to populated areas, human quarters, working areas etc.)
- Proper design, operation and maintenance of waste storage facilities and gas collection facilities
- Regular monitoring to ensure compliance of operation and maintenance agreed practices

- Frequent monitoring to prevent/minimize biogas leakage during normal operation conditions
- Consider treatment of raw biogas on site to eliminate hydrogen sulfide and ammonia content in order to prevent the formation of corrosive sulfurous, sulfuric and nitrogen oxides
- Planning and carrying out proper waste disposal practices (avoiding discharge of untreated effluents in nearby agricultural land or waterways)
- Provision of fire prevention measures in case of large plant

77. The EAs for solar based mini-grid, micro-grid, wind power, mini-hydro, biomass or biogas based electricity will follow the government procedure for environmental clearance. The reports will be submitted to the respective development partners for review and clearance prior to clearance of construction. An appraisal (for SMG) format to be followed is explained in Annex-9. An updated version of ESIA report format is also attached in Annex-10. In addition, IDCOL will follow preliminary assessment on the environmental and social impacts.

78. For the solar irrigation pumps, environmental screening with environmental management plan will be carried out. IDCOL will monitor and ensure the environmental compliance as per management plan. In Annex-13, a format of assessing environmental impact of solar irrigation project is attached which is to be duly filled up by the Project sponsor and verified by the respective official of IDCOL

5.2.3 Household Energy

79. IDCOL will ensure that improved cook stove (ICS) are being prepared in an environment friendly atmosphere. Households currently use traditional fuels such as wood, twigs, leaves, agricultural and plant residues, paddy husk, jute sticks and dried animal dung for cooking. Under this project, the combustion process of these fuels will be improved by raising the stove efficiency that will reduce the smoke containing large amount of particulate matter and gaseous pollutants. IDCOL will engage an independent consultant to monitor the compliance and efficiency of the certain percentage of ICS manufacturing plant.

5.2.4 CFL

80. A national guideline for collection of waste CFL bulbs will be developed incorporating good practices in the developed and regional countries. There should be also awareness raising initiatives including safety instruction at CFL packets, proper collection and disposal of expired CFL bulbs in a safe manner. The project will also explore options for recycling the glass materials from the destroyed incandescent light bulbs.

5.3 GENDER AND SOCIAL DIMENSION OF THE PROJECT

81. IDCOL will adopt the following gender-related design features such as: (i) assess internal mechanisms and capacities to promote greater visibility of gender and social inclusion considerations in the design of its subprojects; (ii) ensure that all recipient sub-projects and sub-borrowers under the Project will identify and maximize opportunities for women's participation in all employment opportunities during construction, operation and

maintenance of infrastructure, with potential adoption of evidence-based gender-related targets; (iii) promote adherence to national core labor standards and commitments to gender equality and women's empowerment stated in the Government's legislation and regulations; (iv) assess the social and gender impact of the SHS program—and the potential use of other identified women friendly technologies for greater social and gender-related benefits; and (v) ensure the use of the Gender Action Framework as has been provided as Annex-12, developed for the Project in the design of the ensuing subproject .

82. IDCOL will disseminate information to its sub-borrowers on (i) the Government's National Policy for Women's Advancement which has been reflected in the Sixth Five-Year Plan; and (ii) Bangladesh Bank's Department of Financial Institutions and Markets (DFIM) Circular no.2 on Actions Corporate Social Responsibility in Financial Institutions, which requires financial institutions to report on gender equality-related performance indicators bi-annually.

A framework for tribal people development will be followed. The detail of the frame work has been shown in the Annex 20.

5.4 PRINCIPLES FOR SAFEGUARD MANAGEMENT

83. The objective of the ESMF is to ensure that activities under the proposed operations will address the following issues:

- If possible avoid, or minimize potential negative environmental and social impacts as a result of either individual subprojects or their cumulative effects;
- Enhance positive environmental and social outcomes;
- Protect environmentally sensitive areas from additional disturbance from project interventions;
- Protect human health;
- Compensate the GHG emission during operation of SHS due to Lead-acid battery;
- Ensure compliance with ECR, 1997 and safeguard policies and standards of the WB, ADB JICA and KfW;
- Maintain gender neutral attitudes in construction and operation of sub-projects;
- Ensure the compliance of Labour Law 2006 and ILO requirements (as are applicable) by all entrepreneurs associated with the REREDP;
- Ensure womens' participation in sub-project activities according to the skills and requirement.

84. In view of the ESMF objectives and assessment of the nature, the project will be based on the following principles:

A. SOCIAL ASPECTS

85. **Involuntary resettlement:** IDCOL will not allow any type of land acquisition resulting involuntary resettlement. No public lands will be used for any sub-project. Land, whether made available via direct purchase, or leasing will be screened to ensure that no physical or economic displacement of communities/persons will take place. Private lands which are disputed or have encroachments on them (informal settlers, non-titled entities) will not be used for the project. It may be mentioned that such encumbrances are very rare in rural areas. For screening involuntary resettlement and tribal people aspects, a well-structured questionnaire for social compliance (Annex-2) will be followed. In most of the cases, the private sponsors (NGOs or other partner organizations) have put up the value of purchased land as their equity. The same approach will be used for all components of the current project, including the purchase of land for the mini-grids.

86. **Tribal peoples:** The project may extend facilities in areas where indigenous people (IPs) live. However, availing the facilities/services/products is purely on a voluntary basis for all paying customers (including IPs). In case of the mini-grids too, the connections will be made on a purely commercial basis, same as in the previous pilot sub-projects. In case of the cook-stoves component, the customers (whether IPs or not) will have to buy the product on a voluntary basis. No negative impacts are anticipated towards IPs. SHSs are also being installed in IP areas like Chittagong Hill Tracts through Partner Organizations (POs), which are well-versed in IP languages to offer adequate consultation on maintenance of products and proper usage of facilities offered. The POs will follow the TPF and prepare and implement the TPP included above after duly completing the screening process.

87. **Social Audit**: A third party monitoring agency will be engaged to assess and monitor the social safeguards compliance, with focus on the land and IP issues, on an annual basis. This can be combined with the yearly environmental audit.

88. **Capacity building on Gender Development:** IDCOL will adopt measures to enhance its institutional capacity on social safeguards preferably on gender aspects, which will facilitate to address gender aspects in its operation in a more satisfactory manner.

B. ENVIRONMENTAL AND HEALTH SAFETY ASPECTS

89. Selection of new battery suppliers: It is already said that the manufacturing of lead-acid battery is associated with significant environmental and health safety impacts. So, IDCOL will require ISO 14001:2004 and OHSAS 18001:2007 certifications for battery manufacturing plant and expired battery recycling plant. The detail of the battery supplier enlistment criteria has been provided in Annex-3, which has covered the requirements as are applicable to local and imported battery supplier.

90. Selection of new PV panel suppliers: It is already said that the manufacturing of PV panel more specifically PV cell manufacturing process is associated with significant environmental and health safety impacts. So, IDCOL will require ISO 14001:2004 and OHSAS 18001:2007 certifications for PV panel manufacturing plants. The detail of the PV panel supplier enlistment criteria has been provided in Annex-4, which has covered the requirements as are applicable to local and imported PV panel supplier. In addition, IDCOL will try to formulate technical requirement for ensuring application of PV panel with more life time and less disposal requirement.

91. EHS measures about CFL bulbs: The main objectives of introducing CFL bulbs through ELIB Program were energy efficiency and reduction of pollution. But in adequate management and improper awareness, the CFL bulb could become a matter of significant health safety concern requiring immediate measures such as:

- *Management Policy of CFL*

92. To ensure the proper EHS measures, there should be a national CFL Management Policy which will clearly depict all necessary measures, as are required for proper handling during operational phase as well as disposal phase including the recycling/*reuse* arrangement.

- *Provide Technical and Financial Support*

93. Based on the recommendations and guidelines of the CFL Management Policy, the respective *stakeholder* is expected to provide required financial and technical support for their implementation.

94. **Proper disposal of PV Panels:** According to the 'Study on the Impact of Photovoltaic Panels (PV panel)' by European Commission in 2011, PV Panels associate with Lead and Cadmium leaching having potential risk to contaminate soil and water. Moreover, there is also hazards associated with glass and aluminum. So, there is a dire need of a PV Panel Disposal Policy. Because due to natural calamity like Sidr, Aila and regular cyclones, a significant numbers of panel are assumed to be affected and need immediate disposal in an environment friendly manner. Moreover, there is informal concern that quality of some of the PV panels may not be good enough to survive upto the anticipated warranty period. As a result, an Action Plan needs to be formulated to determine the actual course of actions in case of proper disposal of PV Panel.

95. **Divisional battery breaking point:** In general, about 50% of electrolyte (Sulfuric Acid) of a Lead-acid battery remains un-utilized after the expiration of life period. But none of the expired battery recyclers in Bangladesh collect expired battery with electrolyte. They raise the issue of weight and fire hazard**.** So, initiative has to be adopted to to convince the battery recyclers to collect expired battery with electrolyte and set-up divisional breaking point at all seven divisions in Bangladesh**.**

96. **EHS measures in case of bio-gas plant:** According to the Department of Environment, Bangladesh if any cattle farm belongs to 10 cattle in urban area or 25 cattle in rural areas, the project has been categorized as **Orange A** category, meaning that it requires a brief Environmental Impact Assessment Report (IEE). In case of poultry, the numbers are up to 250 and up to 1000 respectively." But "if any cattle farm

belongs to more than 10 cattle in urban area or more than 25 cattle in rural areas, the project has been categorized as **Orange B** category, meaning that it requires detail Environmental Impact Assessment Report (EIA). For any commercially operated biogas project, there should be an environmental impact assessment by the project sponsor for any number of cattle's/birds or any location (urban or rural). The environmental assessment report is to be submitted to IDCOL, which could be shared with stakeholders. The respective official of IDCOL will visit the project site and will assess the suitability of the site in respect of environmental and social and safeguards, which will also be shared to the relevant stakeholders.

97. **EHS measures in case of bio-gas and biomass based power project:** In parallel of ensuring the requirement of the DOE in case of bio-gas and biomass based power project, the respective official of IDCOL will visit the project site and will assess the suitability of the site in respect of environmental and social safeguards. This report will be duly submitted to relevant development partners during the appraisal process of each new project. But in case of operational phase, there will be a regular monitoring of environmental and social safeguards.

C. CAPACITY BUILDING

98. **Capacity building on basic EHS aspects:** IDCOL is arranging quarterly EHS awareness session by focusing on the battery manufacturers and recyclers. In addition, it also provides awareness raising training to the POs annually. IDCOL will continue this quarterly training to the battery recyclers as well as manufacturers. In addition, there will be an initiative for a separate session in Training of Trainers (ToTs) to disseminate basic EHS awareness.

99. **Capacity building on Gender Development:** IDCOL will adopt measures to enhance its institutional capacity on social safeguards preferably on gender aspects, which will facilitate to address gender aspects in its operation in a more satisfactory manner.

D. DEVELOPMENT OF COORDINATION COMMITTEE

100. **Developing Synergy:** With the representative of all stakeholders a Co-ordination Committee may be informed who will discuss with government and other relevant entities to adopt the required legal measures to ensure proper management of matter manufacturing and recycling in regard of environment and health safety.

E. COMPENSATION AND MITIGATION MEASURES

101. **Air Treatment Plant (ATP) at Formation Unit:** It is assumed that that during formation of lead-acid battery, significant amount of Sulfur-di-Oxide (SO_2) and Hydrogen sulfide (H_2S) emit, which results serious health hazard to the workers and adjacent neighborhood. So, IDCOL has required all battery suppliers will have to install the ATP with proper design and scrubber facility especially in the formation unit. In addition, there should be also arrangement of safety wash and emergency eye wash facility

102. **Two-Tree Model:** It is true that in spite of adopting a number of measures, all sorts environmental and health safety adverse impacts associated with the REREDP

projects are inconvenient to address. So, there should be an arrangement of compensation measure. In this regard, 'Two-Tree Model' can be a suitable option as compensation measure. Under this scheme for each SHS, two trees will be distributed to the customers at free of cost, of which one tree will be of fruit producing and another one will be wood producing. In this regard, IDCOL has already had discussion with a number of stakeholders including the Department of Forest. In this regard, an Action Plan could be formulated.

F. DELISTMENT CRITERIA

103. De-listment criteria for ISO 14001:2004 (Environmental Management System)[2] and OHSAS 18001:2007 (Occupational Health and Safety Management System)[3]

104. Certification Agency: IDCOL has required the ISO 14001 and OHSAS 18001 certifications to make sure the extra vigilance in implementation of EMS and OHSAS properly. So, IDCOL will go for permanent delistment for certification body according to the criteria as has been mentioned in Annex-5 if there is inadequate response from the certification bodies.

105. De-listment criteria for battery suppliers: If any battery supplier fails to submit the quarterly EHS compliance report and/or fails to attend the compliance meeting it has to explain the reason within two weeks (14 days) in writing. If any battery supplier fails to meet this requirement, it will be temporarily de-listed from IDCOL list of suppliers for at least three months. The same measures will be applicable to any battery supplier as is found significantly non-responsive about the desired level EHS compliances.

106. All battery suppliers under IDCOL SHS program irrespective of local manufacturers and importers have to establish their own recycling plant by June 30, 2016.

G. GRIEVANCE MECHANISM

107. IDCOL has an established method for addressing grievances in this project. All customers relevant to all sub-projects are given the contact numbers for IDCOL Customer Care Center which is staffed by male and female members. All complaints are recorded and a computerized documentation process shows exactly which complaints have been resolved and which require follow-up. Complaints are then registered at the relevant branch offices where they are resolved. If the complaint is not resolved at this stage the complainant is directed to the head of the project proponent agency at the monthly Operational Committee Meetings where all senior officials of all project proponent agencies are required to be present. In the rare event that complaints are not resolved at this stage also, the customer is free to go for legal action.

[2] ISO 14001:2004 specifies requirements for an environmental management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and other requirements to which the organization subscribes, and information about significant environmental aspects.

[3] OHSAS 18001 is an occupational health and safety assessment series for health and safety management systems. It is intended to help an organization to control occupational health and safety risks.

H. Promoting New Components

108. This harmonized ESMF has been designed based on the potential adverse impacts of current project components. But due to the increasing trend of number, types and technology of rural electrification, renewable energy and energy efficient project, IDCOL should have an independent EHS impact assessment measures in case of promoting new project/project components. It will help IDCOL to address the EHS issue in a more efficient manner and enhance brand image to a greater extent. In this regard, IDCOL is expected to follow the guidelines as has been provided in Annex-11.

I. Access to Information

109. The harmonized ESMF has been prepared by IDCOL in consultation with the relevant project stakeholders including POs (NGOs), battery manufacturers, existing and potential users of renewable energy technologies, other agencies. The ESMF will be made available in the website of IDCOL and other stakeholders. In addition, there will be also the summary of the ESMF written in Bengali language and available in the website.

VI. MONITORING AND REPORTING OF ESMF IMPLEMENTATION

110. IDCOL has gained experience in implementing environmental management framework by complying with the safeguards requirement of the WB, ADB and the Department of Environment (DOE). IDCOL has established an independent Environment and Social Safeguards Management Unit (ESMU) to institutionalize the environmental and social management in its operation. It has already deployed a full-time Environmental Specialist.

111. Monitoring the EHS compliance of battery suppliers and recyclers: IDCOL will half-yearly monitor all en-listed recycling plants to assess their compliance in respect of the requirement of ESMF.IDCOL will monthly monitor at least 2 (two) battery manufacturing plants of two manufacturers to assess their compliance in respect of the requirement of ESMF.

112. Monitoring the EHS compliance of solar irrigation project: IDCOL will quarterly monitor environmental and social compliances of at least 3 (three) operational solar irrigation projects. But in case of new solar irrigation project, the respective official of IDCOL will visit the project site and assess the suitability of site in respect of basic environmental and social aspects of each project, which is to be duly submitted to the relevant stakeholders with attachment of EHS Screening Report as is to prepared by the project sponsor.

113. Monitoring the EHS compliance of solar mini-grid project: IDCOL will half-yearly monitor the implementation of EMP and relevant environmental and social compliances of at least 2 (two) construction/operational solar mini-grid projects. But in case of new mini-grid project, IDCOL will visit the project site and assess the suitability of site in respect of basic environmental and social aspects, which is to be duly submitted to the relevant stakeholders with the attachment of EIA report as is to be prepared by the project sponsor.

114. Monitoring of the EHS compliances of POs: IDCOL will monitor at least 2 (two) branch offices of two separate POs to assess the environmental and health safety compliance including management of lead-acid battery and so on

115. Monitoring the distribution of new battery as well as collection of expired battery: IDCOL will strengthen monitoring on distribution of new battery as well as collection of expired battery. IDCOL will assign its Solar Inspectors to monitor the distribution of new battery as well as collection of expired battery. With the monthly inspection report, they have to submit report about distribution of new battery and collection of expired battery scenario. IDCOL will quarterly submit the collection of expired battery and distribution of new battery status report to the development partners.

116. Monitoring of land purchase: IDCOL will regularly monitor the land purchase processes and application of screening mechanism to rule out any displacement. In this regard, the respective official of IDCOL will visit the project site in case of solar irrigation and mini-grid and will have focus group discussion with male and female group, in case of necessity. In addition, he needs to have consultation with the representatives of civil society, relevant local government authority to ensure that here is no dispute with land, gender impact and valuation issue.

117. Monitoring of ICS manufacturing plant: IDCOL will quarterly monitor at least two operational ICS manufacturing plants to assess the basic environmental and health safety compliances.

118. Monitoring of commercial bio-gas project: IDCOL will half-yearly monitor the implementation of EMP and relevant environmental and social compliances of construction/operational commercial bio-gas projects. But in case of new commercial bio-gas project (where bio-gas is used from cooking purpose0, IDCOL will visit and assess the suitability of the site in respect of environmental and social safeguards.

119. Monitoring of bio-gas and biomass based power project: IDCOL will half-yearly monitor the implementation of EMP and relevant environmental and social compliances of at least 2 (two) construction/operational bio-gas and biomass based power projects. But in case of new bio-gas and biomass based power projects, IDCOL will visit and assess the suitability of the site in respect of environmental and social safeguards.

120. Reporting by IDCOL: The reporting and monitoring schedule with disclosure arrangement is provided in Table 02.

Table 02: Monitoring and Reporting schedule of IDCOL under REREDP

Sl. no	Project component	Monitoring and Reporting Issue	Frequency of Monitoring	Reporting Schedule	Disclosure
01	**Solar Home system**	Environmental and health safety (EHS) compliances of all IDCOL en-listed battery recycling plants with their effectiveness of ESMF implementation.	**Yearly**	Yearly Report	IDCOL website
		EHS compliances of all IDCOL en-listed battery suppliers with their effectiveness of ESMF implementation.	**Monthly** (manufacturing plant of two suppliers in each month)	**Quarterly** Report by comprising the observation of monthly monitoring	IDCOL website
		Expired battery collection and distribution of new battery	**Six Monthly** (collect monthly report from POs and battery recyclers and compile)	**Six Monthly**	IDCOL website
		Quarterly EHS Compliance meeting at IDCOL for raising awareness of battery recyclers and manufacturers and assess their status of EHS implementation based on the submitted quarterly report	**Quarterly** (all battery recyclers and suppliers will attend the quarterly meeting, submit Compliance Report and share findings, IDCOL will arrange awareness raising presentation and so on.)	**Quarterly** (Outcome of the quarterly meeting based on the observation of the quarterly report submitted by the manufacturers and recyclers as well as presentation provided by IDCOL and other participants)	IDCOL website
02	**Solar irrigation**	Basic environmental, social and health safety compliance assessment of solar irrigation project under construction/operation.	**Quarterly** (at least three operational projects)	**Quarterly** (based on the observation of monitoring)	IDCOL website
		Assessment of suitability of project site in respect of basic environmental and social aspects for each new solar irrigation project as is to be installed.	**Once** for each project during appraisal process	**Once** during appraisal process	e-mail to respective stakeholders
03	**Mini-Grid**	Basic environmental, social and health safety compliance assessment including implementation of EMP of solar mini-grid project under construction/operation	**Half-yearly** (at least two operational projects in each six months)	**Half-yearly** (based on the observation of monitoring)	IDCOL website
		Assessment of the suitability of project site in respect of basic environmental and social aspects for each new mini-grid project.	**Once** for each project during appraisal process	**Once** during appraisal process	e-mail to respective stakeholders
04	**ICS**	Environmental and health compliance of manufacturing, operation and maintenance of ICS.	**Quarterly** (at the least three ICS manufacturing plant of three POs)	**Quarterly**	IDCOL website
05	**Biogas project**	Basic environmental, social and health safety compliance assessment including implementation of EMP of commercial bio gas based project under construction/operation	**Half-yearly** (at least two operational projects in each six months)	**Half-yearly**	IDCOL website
		Assessment of the suitability of project site in respect of basic environmental and social aspects for each new	**Once** for each project during appraisal process	**Once** during appraisal process	e-mail to respective

Sl. no	Project component	Monitoring and Reporting Issue	Frequency of Monitoring	Reporting Schedule	Disclosure
		commercial biogas project.			stakeholders
06	**Biogas and biomass based power project**	Basic environmental, social and health safety compliance assessment including implementation of EMP of commercial bio gas/biomass based project under operation	**Half-yearly** (at least two operational projects in each six months)	**Half-yearly**	IDCOL website
		Assessment of the suitability of project site in respect of basic environmental and social aspects for each new commercial biogas project.	**Once** for each project during appraisal process	**Once** during appraisal process	e-mail to respective stakeholders
07		Describe the status of ESMF implementation over the annual scenario	**Annual Report**	**Annual**	IDCOL website

ANNEX 1: ENVIRONMENTAL AND SOCIAL ASSESSMENT CHECKLIST

Project Settings

(a) Location :

(b) GPS Coordination :

(c) Description of land :

- Nature of land ownership :
- Level from the road :
- Lower level from the road :
- Requirement for land filling :

(d) Description of the project site

- Distance from the east side :
- Distance from the west side :
- Distance from the north side :
- Distance from the south side :

(e) Proposed customers

- Households :
- Shops :
- Offices :
- Educational institutions :
- Mosque :
- Union Parishad :
- Rice mills :
- Husking mills :

Environmental Screening

CRITERIA	Details
PROJECT SITTING	Buffer Zone: 1 km
IS THERE ANY CULTURAL HERITAGE SITE LOCATED IN THE PROJECT AREA?	
IS THERE ANY PROTECTED AREA LOCATED NEAR THE PROJECT AREA?	
IS THE PROJECT SITE PRONE TO FLOODING OR NOT?	
IS THERE ANY MANGROVE IN THE PROJECT SITE	
Will the project cause any damage of historical /cultural monuments (mosque/ temple/ church/ madrasa/ school/ college/ grave yard etc.) of the	

project site?	
Will the project cause any Encroachment into precious ecosystem (e.g. sensitive habitats like protected forest areas or terrestrial wildlife habitats)?	
Will the project cause any dislocation or involuntary resettlement of people?	
Will the project cause any risks vulnerabilities related to occupational health and safety due to physical, chemical hazards during project construction and operation?	
Will the project cause any aesthetic degradation and property value loss due to establishment of plant and ancillary facilities?	
Will the project cause any risks for community safety due to the transport, storage, and use and/or disposal of materials such as raw materials, fuel and other chemicals during construction and operation?	
Is there any tree clearing required in the project site?	
Name of the Flora (0-200 meter form the project site):	
Name of the Fauna (0-200) meter form the project site):	

Social Screening

CRITERIA	Details
PROJECT SITTING	Buffer Zone: 1 km
Is there any recorded litigation issue associate with the site?	
Is there any local communities (para/village) live near (200 meter) the project site? Please explain	
Any Local conflicts of Interest in the proposed project site?	
Does the water usage in the project might affect the surround communities?	
Is there any minorities / indigenous (IP) communities live near the Project site?	
Is there any impact of the project on livelihood pattern of tribal people?	

Environmental & Social Benefits from the Proposed Project

Environmental benefits	
Social benefits	

Potential Environmental and Social Impacts

Aspect	Key potential impact	Mitigation measures	Performance indicator
Pre-construction Phase			
Land Use	The proposed project may degrade surrounding agricultural land.		
Flood Hazards	Flood may damage the Project and its various components.		
Land Filling/ Earth Filling (approximately XX feet)	▪ Pollution from overflow of filled earth (dredged materials). ▪ Top soil loss if earth filling by the agricultural land erosion from the filled materials and side slope of filled lands. ▪ Leaching from the filled sediments may damage nearby agricultural lands. ▪ Reducing flood plain storage area and increase local flooding.		
Construction Phase			
Visual Amenity	Visual impacts from construction activities such as materials lay down, excavation and backfilling		
Air Quality	▪ Dust generation due to construction activities. ▪ Exhaust Emissions due to operation of construction plant and Machinery.		

Aspect	Key potential impact	Mitigation measures	Performance indicator
Noise	Increased noise levels during the construction & machinery handling period		
Soil	Soil disturbance due to removal of top soil and potential accidental spillage		
Waste Generation	Improper management and handling of hazardous and non-hazardous waste during construction.		
Health and Safety risks	▪ Potential of exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.		
Operation Phase			
Visual Amenity	Potential glare from PV panels		
Air & noise	PV panel damage, Battery damage or acid spillage. Vibrational Noise from the backup generator		
Soil	Potential spillage of stored oil and chemicals		
Health and Safety	Potential of exposure to safety events during operation activities such as slipping and tripping, working at height		

Aspect	Key potential impact	Mitigation measures	Performance indicator
	activities, and fire		
Social Impacts			

Compliance Scenario

DOE Requirement

According to the categorization of Department of Environment (DOE), the Project seems to fall in **RED category**. For taking up a project, the sponsor needs to obtain the clearance from the DOE in three stages as per requirement of the country:

- Initial stage : Site Clearance Certificate (SCC)
- Advanced stage : Environmental Clearance Certificate (ECC)
- Follow-up stage : Annual renew of ECC

Initial Stage

Without the SCC, the sponsor cannot apply for approval of the civil design of the project to the local authorities. For obtaining the SCC the following two documents need to be submitted to the DOE:

- An Initial Environmental Examination (IEE) Checklist
- A TOR for detailed Environmental Impact Assessment (EIA)

After SCC is obtained, the sponsor can proceed for land development and other primary civil works.

Advanced Stage

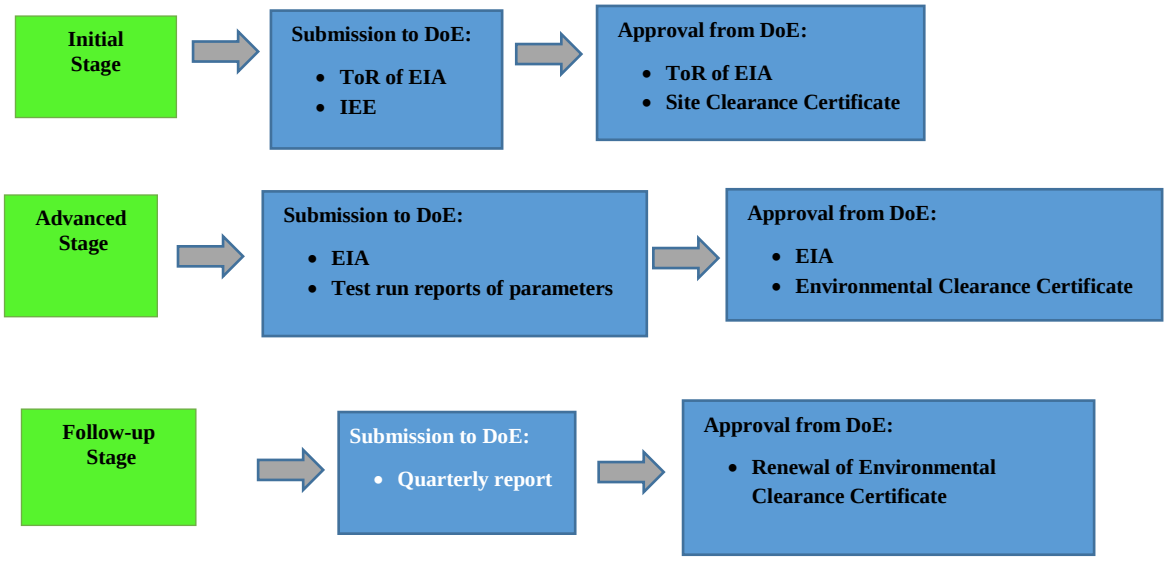
After having SCC the sponsors need to proceed for ECC. For obtaining ECC the EIA has to be submitted to DOE. The EIA will include the following documents:

- No objection certificate from local authority
- Outline of the plan for relocation and rehabilitation (If applicable)
- Feasibility Report
- Environmental Management Plan (including process flow diagram, layout plan, effluent treatment plant and its effectiveness)
- Emergency Plan relating to adverse environmental impact and plan for mitigation of the effects of pollution
- Detail Plan for addressing the TOR already submitted

Construction of super-structure and erection of capital machinery can be done after obtaining the ECC.

Follow-up Stage

The follow-up stage starts after having ECC and starting commercial operation. The Project Company has to submit quarterly test report of certain parameters like Sox, NOx, Co, PM10, PM2.5, water quality etc. according to the EMP as mentioned in the approved EIA. The most important activity under follow-up stage is to **renew ECC** every year. The aforesaid three stages have been presented in the following:



The Project Company has been informed about the required environmental compliance process. They are in the process of engaging an EIA Consultant.

ANNEX 2: SCREENING OF SOCIAL COMPLIANCE (WB)

A. Involuntary Resettlement Aspect

- Is any land acquisition required for the project?
- Type of land (public, private or lease)
- Is there any settlement present in the site?
- Is there any recorded litigation issue associate with the site?
- Is there any close relationship between the general livelihood pattern and the site in the project area?
- Does the project require physical or economic displacement of any person/household/community?

B. Tribal People Aspect

- Is the project site located within the habitat of tribal people?
- Is there any impact of the project on religious and cultural practice and belief of tribal people?
- Is there any impact of the project on livelihood pattern of tribal people?
- Is there any settlement recorded (present and near past) in the site?
- Is there necessity of displacing (physically or economically) any person/household/community?
- What local language(s) is (are) used by the IP population?
- Are the PO staffs conversant in these languages and is the information material relevant to the terms and conditions of purchasing the services and operation and maintenance of equipment available in local languages?

ANNEX 3: GUIDELINES FOR SELECTING NEW BATTERY SUPPLIER[4]

A. Local Battery Supplier

The battery supplier, who will supply battery made in Bangladesh, has to comply the following requirements, to supply battery in IDCOL's SHS program:

1. **Compliance with Department of Environment:** The respective battery supplier has to submit the Environmental Clearance Certificate as is issued by the Department of Environment. And they have to submit sufficient evidence that the requirements/terms and conditions of the DOE are sufficiently implemented.

2. **ISO 14001:2004 and OHSAS 18001:2007 compliances:** The battery supplier has to be ISO 14001:2004/2005 and OHSAS 18001:2007 certified from a certification body as is approved by International Accreditation Forum (IAF) or American International Accreditation Organization (AIAO).

3. **Practicing Experience:** During IDCOL EHS audit, if it is found that the supplier has failed to install properly design ETP, ATP, and above all to meet the major clauses of the aforesaid two standards, it has to alleviate all limitations as well as to show the record of practicing the aforesaid two compliances at least six months individually. Thereafter, its en-listment may be considered

4. **Basic Infrastructure:** All basic infrastructures including effluent treatment plant an air treatment plant (ATP) have to be fully operational. During application in IDCOL, the design detail of ETP and ATP are to be submitted. No exhaust fan will be considered as an alternative of ATP. In addition, the formation will be completely closed. No fume will be allowed to move freely in the unit. They must be properly neutralized.

5. **Safety shower and emergency eye-wash equipment:** The supplier has to ensure installation of adequate number of safety shower and emergency eye wash equipment at suitable places in the battery manufacturing plant, especially in acid intensive areas.

Photographs: A typical emergency shower and safety eye wash equipment

[4] This guideline is already in practice in IDCOL REREDP to ensure better EHS management in battery manufacturing plant.

6. **Technical Standard:** The battery has to meet the compliances and standards required by Technical Standard Committee of IDCOL.

7. **Recycling arrangement:** The respective battery supplier has to submit a legally approved contractual arrangement with IDCOL en-listed expired battery recycler.

8. **Baseline EHS Assessment Report:** The battery supplier has to submit an EHS compliance Report by mentioning how he is complying with the environmental and occupational health safety aspects.

9. **Disclosure of EHS Assessment Report:** The EHS assessment Report, irrespective of being prepared by an independent third party or IDCOL representative is to be duly disclosed to all relevant development partners.

B. Imported Battery Supplier

If a battery supplier approaches to supply imported battery in IDCOL SHS program, he has to comply with the following requirements in addition of the technical requirement of IDCOL:

1. **Statutory requirement:** The respective battery supplier has to submit Environmental Clearance Certificate as is issued by the respective entity of the respective country;

2. **ISO 14001 and OHSAS requirement:** The respective battery supplier has to submit ISO 14001 and OHSAS 18001 compliance certificates of the respective battery manufacturing plant.

3. **Baseline EHS Assessment Report:** The battery supplier has to submit an EHS Assessment Report by mentioning how he is complying with the environmental and occupational health safety aspects.

4. **Disclosure of EHS Assessment Report:** The EHS assessment Report, irrespective of being prepared by an independent third party or IDCOL representative is to be duly disclosed to **all relevant** development partners.

5. **Recycling arrangement:** The respective battery supplier has to submit a legally approved contractual arrangement with IDCOL en-listed expired battery recycler. From 1 January 2015 IDCOL will not en-list any battery suppliers having no independent battery recycling plant.

ANNEX 4: GUIDELINES FOR SELECTING NEW PV PANEL SUPPLIER[5]

A. Local PV Panel Supplier

The supplier, who will apply to supply PV panel made in Bangladesh, has to comply with the following procedure to be enlisted in IDCOL's SHS program:

1. **Compliance with Department of Environment:** The respective PV Panel supplier has to submit the Environmental Clearance Certificate as is issued by the Department of Environment. And they have to submit sufficient evidence that the requirements/terms and conditions of the DOE are sufficiently implemented.

2. **ISO 14001:2004 and OHSAS 18001:2007 compliances:** The PV panel supplier has to be ISO 14001:2004 and OHSAS 18001:2007 certified from a certification body as is approved by International Accreditation Forum (IAF) or American International Accreditation Organization (AIAO).

3. **Practicing Experience:** The supplier has to prove the record of practicing the aforesaid two compliances at least six months individually. In this case of the two compliance certificates, six (6) months will be counted from the date of issuing of latter one.

4. **Technical Standard:** The PV panel has to meet the compliances and standards required by Technical Standard Committee of IDCOL.

5. **Baseline EHS Assessment Report:** The PV panel supplier has to submit an EHS Assessment Report by mentioning how he is complying with the environmental and occupational health safety aspects.

6. **Disclosure of EHS Assessment Report:** The EHS Assessment Report, irrespective of being prepared by an independent third party or IDCOL representative, is to be duly disclosed to all relevant development partners.

[5] This guidelines is introduced in this harmonized ESMF for ensuring better EHS management

B. Imported PV Panel Supplier

If a PV panel supplier approaches to supply imported PV Panel in IDCOL SHS program, he has to comply the following requirements in addition of the technical requirement of IDCOL:

1. **Statutory requirement:** The respective panel supplier has to submit Environmental Clearance Certificate as is issued by the respective entity of the respective country;

2. **ISO 14001 and OHSAS requirement:** The respective PV panel supplier has to submit ISO 14001 and OHSAS 18001 compliance certificate of the respective PV panel manufacturing plant.

3. **Baseline EHS Assessment Report:** The PV panel supplier has to submit an EHS Assessment Report by mentioning how he is complying with the environmental and occupational health safety aspects.

4. **Disclosure of EHS Assessment Report:** The EHS Assessment Report, irrespective of being prepared by an independent third party or IDCOL representative**,** is to be duly disclosed to all relevant development partners.

ANNEX 5: GUIDELINE OF DE-LISTING OF ISO AND OHSAS CERTIFICATION BODIES[6]

A. Criteria for Temporary De-listment

If any ISO and OHSAS certification body providing ISO 14001 and OHSAS 18001 certifications to battery suppliers, recyclers or PV panel suppliers is found to be alleged with any of the following misconduct, it will be temporarily de-listed from IDCOL list of approved certification bodies for six months:

1. Issuance of ISO 14001 and OHSAS 18001 certificates before the company/factory is being awarded the Environmental Clearance Certificate from the Department of Environment.
2. Issuance of ISO 14001 and OHSAS 18001 certificates without the detail design of ETP of ATP, where they are required. The design of ETP is to be clearly mentioned the specification/capacity of all components and design aspects like design flow rate, capacity of mixing tank, primary clarifier, sludge holding tank and so on.
3. Issuance of ISO 14001 and OHSAS 18001 certificates without ensuring proper signage, firefighting arrangement and general training arrangement.
4. Issuance of ISO 14001 and OHSAS 18001 certificates without distributing standards and properly orient the requirement of the standards to the top management as well as Management Representative.
5. Issuance of ISO 14001 and OHSAS 18001 certificates based on the incomplete documentation by inadequately covering the requirement of clauses
6. Issuance of ISO 14001 and OHSAS 18001 certificates without considering the basic environmental and health safety standards of the ECR, 1997 like noise level, pH of effluent, chemical standards of effluent. In case of unavailability of standards in ECR, 1997 it has to seek the best practices including IFC EHS guidelines.

B. Criteria for Permanent Delistment

Any ISO and OHSAS certification body as being again alleged with any of the aforesaid aspect, after being temporarily de-listed, will be permanently de-listed from IDCOL list of approved ISO and OHSAS certification bodies.

[6] This guideline is introduced in this harmonized ESMF to ensure better vigilance by ISO and OHSAS certification bodies.

ANNEX 6: INFORMATION OF EXPIRED BATTERIES[7]

Sl. no	ID	Customer name	Unit office	District	Panel serial no.	Panel capacity (wp)	Battery model and size	Manufacturer	Date of return	Sent to (manufacturer)

PO will have to collect data regarding expired batteries and IDCOL will check and store in their database

[7]The format is followed for ensuring proper collection of expired battery. The collection system is

- POs are responsible notify the customers before 3 months of the warranty expiration date and to collect expired batteries from customers and to safely transportation of regional locations of battery manufacturer/recycler.
- The manufacturer/recycler is responsible for collecting batteries from regional centers and to transport it to the site where the batteries will be recycled or disposed in an environment-friendly manner.

ANNEX 7: (a) AGREEMENT FOR BUYING BACK EXPIRED BATTERIES[8]

Agreement for Buying Back of Warranty Expired Batteries

This Agreement (the "Agreement") for Buying back of warranty expired/non-functional (not eligible for replacement under warranty policy) solar battery for safe disposal is executed on…[Date]…among…[Name of a Battery manufacturer]…having its registered office at …[Office Address]…and Participating Organizations of Infrastructure Development Company Limited (IDCOL), as listed below (hereafter **"POs")**:
…[Name of the PO, Office Address]…

Whereas:

1. IDCOL requires the POs to make necessary contractual arrangements with battery manufacturers for environment friendly recycling of all batteries used under IDCOL Solar Energy Program under Section 9.14 of the Participation Agreements between IDCOL and POs;

2. The Government of Bangladesh has issued SRO No. 175-Act/2006 dated 29 August 2006 on collection and recycling of used/non-functional batteries for conservation of environment, improving environmental standard and control and prevention of environmental pollution;

3. The Government of Bangladesh has issued SRO No. 29-Act/2008 dated 11 February 2008 that allows payment of consideration during the return of used/non-functional batteries; and

4. All parties realize the need for safe and environment friendly recycling/disposal of warranty expired/non-functional (not eligible for replacement under warranty policy) batteries under IDCOL Solar Energy Program as per provisions in this agreement.

Now therefore,…[Name of a Battery manufacturer]…& POs do hereby agree as follows:

1. Customer Notification:

PO shall notify the customers before 3 months of the warranty expiration date and advise him/her to replace the battery. The customer is free to continue using the existing battery after warranty period if s/he wants to do so. However, the customer will be required to inform the PO's representative when s/he would stop using the battery after the expiration of warranty period. The PO will incorporate relevant provisions in the SHS sell/lease agreement requiring the customer (a) to furnish the warranty-expired or non-functional (not eligible for replacement under warranty policy) battery to the PO (b) not to keep it with them; and (c) not to sell it to any second party.

2. Collection of Batteries by PO:

[8] This agreement is signed between IDCOL and PO, which ensures that the respective PO will purchase the expired battery from users.

PO representatives will collect the batteries from the customers and store it in the local offices. PO will take necessary measures to ensure safe storage of the batteries. The batteries must be collected within 30 days after the customer stops using it. The PO representative will ensure that no component/part of the battery is left behind and the acid does not spill out of the battery during transportation. POs will not sell any battery to the customers of IDCOL Solar Energy Program without provisions for buying back of the warranty expired/non-functional (not eligible for replacement under warranty policy) battery.
PO will send the warranty expired batteries within 30 days to any of the ten regional locations, designated by Battery Manufacturer, at Dhaka, Chittagong, Khulna, Faridpur, Bogra, Sylhet, Barisal, Borguna, Rangpur, Brahmanbaria.

3. Collection of Batteries by …[Name of a Battery manufacturer]…:

…[Name of a Battery manufacturer]…will collect the batteries from the regional locations and ensure safe transportation of the batteries to the site where the batteries will be recycled/disposed of in an environment-friendly manner.

4. Price & payment:

4.1. The battery manufacturers will pay 24% of the current market price (including VAT) of new batteries to the POs for exchange of warranty expired batteries of similar size at their regional collection points. The salvage value is subject to review for every six months. Salvage value would be retained by the POs as down-payment and remaining price of new battery would be loan from POs to customers. IDCOL will refinance this loan amount which shall not exceed USD 100 equivalent BDT for each battery.

4.2. IDCOL will provide USD 5 equivalent BDT as grant to the PO for collection of each warranty expired from the household subject to the availability of fund.

4.3. The customer's portion of buying back price shall be given during the collection time.

4.4. …[Name of a Battery manufacturer]… will make full payment for bought back batteries through A/C payee cheque in favor of the POs within 45 days of receipt of the batteries in the regional locations.

4.5. Subject to the availability of Fund, IDCOL will provided USD 5 equivalent BDT to the battery recyclers for proper recycling of each battery.

5. Review of price

Both the parties will sit in every six months to review the buy-back price.

This Agreement is signed, sealed and delivered by authorized representatives of …[Name of a Battery manufacturer]… and POs on the date first mentioned above

(b) BATTERY RECYCLING AGREEMENT For (…… kWp Solar Mini Grid Project at ……..District)

THIS AGREEMENT is made on the _____day of _____, 201, (the Agreement) between **……,** having its registered Head Office at ……., represented by its Executive Director, ……(the Buyer) and **……..** BATTERY COMPANY LTD. having its registered Corporate Office at ……, represented by its Managing Director ……. (the Supplier).

A. The Buyer is going to set up a …. kWp Solar Mini Grid Project (the Project) at …… District (the Project Site) for which it requires …. nos. of 1540 Ah, 2V Battery (the Batteries) and the Supplier has been selected for supplying the Batteries through a competitive process.

B. With a view to recycling the Batteries, the Buyer and the Supplier have decided to enter into an agreement to determine the terms and condition of collection and recycling of the Batteries.

NOW THE PARTIES HEREBY AGREE THAT

Section 1. Warranty Service of the Supplier
The Supplier shall provide warranty services of 7 (seven) years to the Buyer for the Batteries subject to the terms and conditions mentioned in the quotation submitted by the Supplier at the time selection.

Section 2: Collection of Batteries

The Supplier shall collect the Batteries from the Project Site at its own cost and arrangement within_____number of days from the date of being informed of damage of Battery/expiry of Warranty Period:

a. If the Batteries are damaged during the Warranty Period; or

b. Upon expiry of the Warranty Period.

Section 3: Recycling of the Batteries

After collection from the Project Site, the Supplier shall recycle every damaged or warranty expired Batteries in environment friendly way.

Section 4: Compliance with Environmental Social Management Framework (ESMF)

During the collection and the recycling of damaged or warranty expired Batteries, the Supplier shall follow the environmental, health and social compliances, under the Environmental Social Management Framework (ESMF) of IDCOL.

Section 5: Price of warranty expired Batteries

The Supplier shall pay the Buyer for the warranty expired Batteries and the Supplier shall pay the price on or before the collection of warranty expired Batteries on the basis of 30% of LME (London Metal Exchange for Lead) price for dry weight which shall be followed on average of the week.

Section 6: Liquidated damages for delay in collection of damaged/warranty expired Batteries

The Supplier shall be liable to pay liquidated damages at the rate of 14 (fourteen) days of delay in collection of Batteries as mentioned in section 2.

Section 7: Sale of the damaged/warranty expired Batteries to any third party

If the Buyer sells the damaged/warranty expired Batteries to any third party, the Supplier shall be discharged from its liabilities for collection and recycling of damaged/warranty expired Batteries under this Agreement and the Buyer shall be responsible to enter into necessary arrangements for collection and recycling of the damaged/warranty expired Batteries with that third party.

Section 8: Dispute Resolution

8.1. *Negotiation*. Any dispute that may arise between the Buyer and the Supplier in connection with or under this Agreement shall be tried to be amicably resolved through mutual negotiation of both parties.

8.2. *Mediation*. If any dispute referred to in paragraph (8.1) above arises and cannot be resolved through negotiation, it will be referred to a third party mediator selected by both parties for a mediated resolution; and the cost of such mediation will be shared jointly by both parties.

8.3. *Arbitration*. In case a dispute is not resolved through methods as per paragraphs (8.1) and (8.2) above, it shall be referred to arbitration under the Arbitration Act 2001 (the **"Act"**) of Bangladesh as the last resort; the arbitral award thereon shall be final and binding; and the cost of such arbitration shall be shared jointly by the parties or as may otherwise be determined under the Act.

IN WITNESS WHERE OF, the parties have caused this Agreement to be signed in their respective names on the date first above written.

FOR …….. 1. Witness

BY.....

FOR …….BATTERY COMPANY LTD.

2. Witness BY…….....

ANNEX 8: Monitoring Format for Renewable Energy Project

A. BATTERY FACTORY EHS MONITORING FORMAT

Name: **Date:**

Question	yes	No	Remarks
Mandatory Questions			
Name of the MR:			
His/her qualification:			
Management review report / minutes:			
Budget Allocation:			
Training report:			
DOE Clearance Certificate:			
Acid License:			
EMS & OHASAS Certificate:			
Civil Defense:			
ETP design and discharge water QC report:			
Exits / Evacuation routes			
Are exit signs, evacuation routes illuminated, visible, marked and maintained clear from work areas?			
Is evacuation plans posted in local language in a prominent place where they can be easily read, with 'You are here' clearly marked?			
Do evacuation plans match the floor layout? Also, areas in front of Exits marked with "KEEP CLEAR" markings and maintained clear.			
Aisles			
Are aisles clearly marked and spacious and maintained clear of any obstruction?			
Emergency lights maintained properly to provide adequate illumination?			
Are all Emergency lights tested monthly and records of test maintained?			

Fire Extinguishers/ Hose Reel / Hydrant			
Is there adequate number of fire extinguishers available and the location are clearly marked? Does it maintained clear of obstruction?			
Are extinguishers visually checked monthly and control tags maintained?			
Are fire extinguishers inspected annually by an outside professional agency;			

Emergency Preparedness			
Does the facility have a documented emergency preparedness program?			
Does the facility conduct evacuation drills and maintain records?			
Does the facility maintain test records of fire alarms and Phone numbers of local fire dept(s)/ factory management and Hospitals Ambulance & Police easily available / posted?			
Are Assembly areas easily accessible and maintained clear?			

Question	yes	No	Remarks
Medical care / First Aid			
Does the First Aid kits provided in all work areas with locations highlighted and easily accessible? Are medicines being checked to ensure that expired medicines are not being administered?			
Does the First Aid kits kept unlocked or if the kits locked, are the keys available within close proximity?			
Is there adequate number of employees been trained in First Aid by a recognized organization and the certificates checked to ensure the validity?			
Does factory conduct checks to ensure that if any first-aid trained employee has left the organization he/she is replaced with another such trained person?			

Lead alloy and Chemical Storage Area			
Is there any appropriate warning signs displayed?			
Is there an effective ventilation system to discharge fumes?			
Is there any effective secondary containment system for liquid chemicals to avoid spillage on floor? Does the floor maintained clean and free of chemical spillage?			
Is MSDS (Material Safety Data Sheet) posted in areas where chemicals are stored / being used?			
Is there any appropriate PPE (Personal Protective Equipment) are available and being used in the chemical storage and usage areas?			
Is entry restricted in the chemical storage area?			
Does hazardous sign or label being used in all drums, containers, and dispensers clearly labeled?			
Eye Wash/shower			
Is there any functional eye wash station available near the chemical storage/usage area/working area?			

Question	yes	No	Remarks
Electrical Safety			
Are all electrical switches labeled in English & local language?			
Are power-generators suitably earthed?			
Is all electrical maintenance carried out, logged?			
Are there any loose wires / damaged switch-gear / unplugged connections/ open junction boxes / taped joints etc?			
Are appropriate fire extinguishers installed near panel boards?			
Are Exhaust pipes of Power generators insulated?			
Are rubber mats provided in front of all Electric Panel Boards?			
Is the Power Generator room maintained free of waste items?			

Question	yes	No	Remarks
Personal Protective Equipment			
Are mesh gloves provided to the operators? Are they being used?			
Are appropriate gloves / masks / eye protection provided for workers in charging			

unit operations? Are they being used?			
Are Appropriate PPEs provided to workers in the washing section? Are they being used?			
Accident Register are updated			
Machinery			
Are exhaust fans installed at safe heights to avoid injury?			
Are fan blades adequately guarded?			
Are safety devices in working condition?			
Are noise levels in work areas within the desired norms?			
Waste Water Treatment (Discharge from Washing)			
Are all discharges within the parameters defined by the country's Environment laws?			

Dining and Kitchen Facilities			
Are Kitchen & Dining area floors maintained clean?			
Is adequate seating arrangement provided?			
Is cooked food kept covered?			
Are those serving food using appropriate gloves?			
Are fire extinguisher's installed near cooking areas?			
Is potable drinking water provided?			
Are hand wash and utensils washing areas well maintained?			
Bathrooms / Toilets			
Are the number of toilets adequate, marked and segregated for both men and women?			
Are wash rooms/ toilets well maintained and ventilated?			
Is running water available?			
House-Keeping			
Are waste chemical removed regularly?			
Are floors cleaned regularly to remove dust and garbage?			
Are floors cleaned and check ventilation system periodically?			
Is garbage appropriately disposed off?			
Storage			
Is all materials appropriately stored on racks or pallets with well-defined aisles between rows, maintained free of obstruction?			
Are the general and trims stores well-kept with passages maintained clear?			
Are fuels like diesel, petrol, cooking gas appropriately stored away from rain and sunlight in well ventilated areas with entry restricted to authorized personnel only?			
Are 'No Smoking' signs and appropriate Firefighting equipment installed in storage areas?			

B. Monitoring / Observation report for environmental, social and health safety compliance of three Solar Irrigation Project (Operational)

C.

Background:

Technical Description:

Solar PV technology: Solar PV modules are used for producing electricity from sunlight
Pumping Technology: Electricity from solar module is used for the operation of the pump. By using pump water is being stored in a heading tank for a time being afterwards water supplied to the adjacent land for agricultural purpose.

Steps Involved:

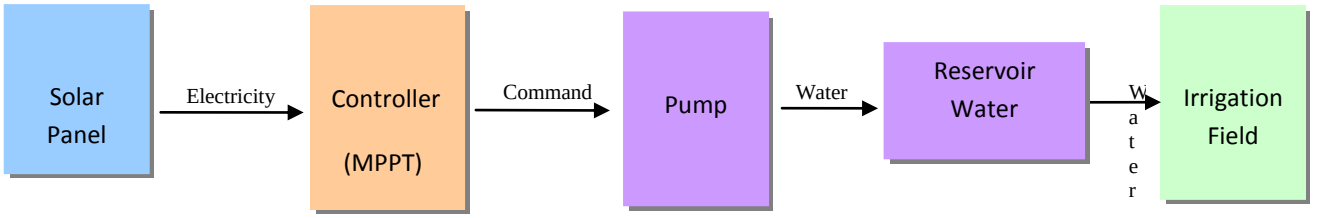


Figure: Solar Irrigation Process

Alternate Usage:

The pump controllers will have a provision for alternate usage, mainly rice husking at all the sites. This will allow the sponsor to utilize the idle electricity of the system to be used at loads similar to that of the pumping motor. The husking machines will be operated only during idle hours of the pumps and hence, there is no competing use of pumps and the husking machine.
Monitoring Methodology:

The observation report been followed the field primary data, visual scenario (environmental, health and social issues), water testing and group discussions with the farmers in the project areas.

Observation:

Environmental Issues need to be observed in the surrounding (forests, wetlands, creeks, streams, undeveloped areas, residential areas, industrial areas, environmentally sensitive areas) environments of the three project areas. Farmers of the project areas are using water for irrigation purpose in their conventional manner to cultivate crops.

Arsenic, pH level and Total dissolve solid (TDS) need to be tested in the project area and health and safety concern need to be varified during the field visit.

Resettlement and tribal people's need to be observed during the field visit

Overview of the Project area:

Queries Of the Projects	Remarks		
Project area:	**1**	**2**	**3**
Source of water-	Ground water	Ground water	Ground water
Areas (decimal) to be covered under irrigation			
Capacity of PV panel (Wp)			
Maximum yield of pump (L/day)			
Size storage of head tanker (Length, breath and height in m) Height:			
Maximum volume of water (L/day) required in a given period of time in dry season.			

Environmental Compliances:

Project area:	**1**			**2**			**3**		
1	**2**			**3**			**4**		
Queries Of the Projects	**YES √**	**NO ×**	**Remarks**	**YES √**	**NO ×**	**Remarks**	**YES √**	**NO ×**	**Remarks**
What is the depth of the pipe used for the extraction water?									
Availability (Flow in L/day or water depth) of ground water source during dry season									

Surrounding environment: Indication of presence of forest, wetlands, creeks, streams, undeveloped areas, residential areas, industrial areas, environmentally sensitive areas, recognized or protected area etc. within 200m periphery of the project command area:									
Is there any future possibility to use the irrigation water for drinking purposes of the local community?									
Crop cultivation practice in the project area:									
Does the project fulfill water requirement for the cultivated fields? [If "No" explain]									

Environmental Health and Safety Issues:

Project area:	**1**			**2**			**3**				
1	**2**			**3**			**4**			**Mitigation Measures**	**Follow up actions**
Queries Of the Projects	**YES √**	**NO ×**	**Remarks**	**YES √**	**NO ×**	**Remarks**	**YES √**	**NO ×**	**Remarks**		
Does the project create any health & safety issues for the villagers?											
Does the water quality of the source meet the national standard?											

Does the project create any significant negative effects on surrounding water, air or noise quality?											

Social Compliances:

Project area:	**1**			**2**			**3**				
1	**2**			**3**			**4**			**Mitigation measure**	**Follow up action**
Queries Of the Projects	**YES √**	**NO ×**	**Remarks**	**YES √**	**NO ×**	**Remarks**	**YES √**	**NO ×**	**Remarks**		
Does the project, comply with the proposed water supply within the irrigation fields?											
Does the project, comply with the committed charge											
Any existence of hidden charges [If yes explain]											
Is there any documented process of collecting charges?											
Does the fees collection process is acceptable or not? [If not please explain]											
Will the communities require awareness or training program on proper use and maintenance of water management?			.								

[If "Yes" – please explain]											
Does the operator require awareness or training program on proper use and maintenance of water management? [If "Yes" – please explain]											

Gender Compliances:

Project area:	**1**			**1**			**1**		
1	**2**			**3**			**4**		
	YES √	**NO ×**	**Remarks**	**YES √**	**NO ×**	**Remarks**	**YES √**	**NO ×**	**Remarks**
Does the project create improved quality of livelihood for the respective families?									
Whether the project is useful to solve the uncertainty of water during the irrigation time?									
Any valuable comments to improve the project? **[While monitoring the project, personnel of IDCOL are consulted with a numbers of stakeholders. Some of their suggestions/comments seem to be noteworthy]**									

D. **Environmental & Social Field Observation report for Improve CookStoves (ICS)**

Component: Improve Cook Stoves (ICS)

P.O's Name & Address:

Date of visit:

Purpose of visit: Over all EHS compliance inspection at the ICS-production center and households

Issues Observed:

At production Center:

Practices of EHS compliance are ……
Environment of production area:
Insertion of Rockwool process:
Storage scenario
The ratio of cement : sand : chips

Pictures as an evidence:

At House Hold Level:

Does the customers need training to use the new version stove …

ANNEX 9: ENVIRONMENTAL CLEARANCE PROCESS OF THE DOE

STEP	ENVIRONMENTAL CLEARANCE PROCEDURE FOR THE PROJECT FOR MAJOR SUBPROJECT
1	Feasibility Report submitted to Department of Environment (DOE) and IDCOL
2	IEE Report Preparation and submission to IDCOL
3	Upon satisfactory adequacy check IEE submitted to DOE and IDA
4	DOE makes decision whether EIA is required or if IEE is adequate
5	If IEE is adequate (no significant environmental issues), DOE provides Environmental Clearance
6	Developer obtains "no objection" letter from Local Authority for site clearance
7	If IEE is not adequate (environmental issues requiring detailed analysis), DOE comments on draft TOR for EIA study
8	Public Consultation on the EIA
9	EIA review by DOE and IDA
10	Finalization of Environmental Management Plan, based on comments/conditions by DOE and IDA
11	Environmental Clearance by DOE and no objection from IDA

ANNEX 10: TERMS OF REFERENCE (ToR) ENVIRONMENT AND SOCIAL ASSESSMENT REPORT FOR MINIGRID

BACKGROUND

The major objective of the Rural Electrification and Renewable Energy Development Project (REREDP II) of Infrastructure Development Company Limited (IDCOL) is to increase access to clean energy in rural areas through renewable energy. It will support: (i) increased access to electricity in rural areas through renewable energy; (ii) large-scale dissemination of more efficient cook stoves and fuels for cooking; and (iii) improved technical and institutional efficiency in the power sector. The proposed additional financing (AF) will contribute towards increasing access to electricity in remote rural areas where grid electricity is not economically viable.

It is understood that mini-grid/micro-grid (solar based system) does not associate with air pollution during operational phase. The primary concerns related to environmental, health, and safety issues are associated with improper manufacturing and disposal of expired lead-acid battery. The project components primarily deal with the solar panels, batteries and generators (which will use as back up). The Environment and Social assessment is required to identify the major environmental and social impacts and formulate required environmental and social management measures. IDCOL as well as all relevant development partners and stakeholders participating in REREDP II have agreed the environmental and social requirements needed for processing the financing of each sub-component. The project is designated as environmental Category B (partial assessment) according to OP/BP of the World Bank and only one environmental safeguard policy OP/BP 4.01 has been triggered.

EHS measures in case of bio-gas plant: According to the Department of Environment, Bangladesh-" if any cattle farm belongs to 10 cattle in urban area or 25 cattle in rural areas, the project has been categorized as **Orange A** category", meaning that it requires a brief Environmental Impact Assessment Report (IEE). In case of poultry- "the numbers are up to 250 and up to 1000 respectively." But "if any cattle farm belongs to more than 10 cattle in urban area or more than 25 cattle in rural areas, the project has been categorized as **Orange B** category", meaning that it requires detail Environmental and Social Impact Assessment Report (ESIA). For any commercially operated biogas project, there should be an environmental and social impact assessment (ESIA) by the project sponsor for any number of cattle's/birds or any location (urban or rural). The environmental assessment report is to be submitted to IDCOL, which could be shared with stakeholders.

Please note that, according to DOE concern- all power generation project has been categorized as RED category.

Legislative bases for EIA or IEE in Bangladesh are the Environmental Conservation Act 1995 (ECA'95) and the Environmental Conservation Rules 1997 (ECR'97). Department of Environment (DOE), under the Ministry of Environment and Forest (MOEF), is the regulatory body responsible for enforcing the ECA'95 and ECR'97. Other law of Bangladesh like Renewable Energy Policy of Bangladesh (2008), Bangladesh Labor Law (2006), etc. will be obliged for the project. Which will also be guided by the World Bank's Safeguards (Relevant Policies) mainly OP 4.01 Environmental Assessment, ADB's Safeguards Policy Statement (SPS) 2009 and other related operational manual (OM Section F1/BP) will be triggered for this project.

Please note that in the Social Impacts:

In the REREDP II project, No land acquisition or displacement of people (with or without title) from private or public lands is permitted in the project. In areas where IP populations are generally found a screening procedure will be followed to identify relevant groups and communities. A brief social assessment will be conducted to describe the general project area, social conditions in the project area including distribution of population in the project area, a brief discussion of the local economy and primary sources of income, A consultation and communication plan will be prepared and implemented (as has been done in previous project phase) to clearly disseminate project information and gather feedback regarding the needs and priorities of IPs so that awareness raising, training etc. can be properly tailored. The communication process must be carefully documented by the project proponents, including keeping photographs and participant's lists. All sessions and communications modes must be in local languages and follow the customs and norms of local communities. The third party monitoring mechanism will assess the safeguards compliance on a yearly basis.

CONTENTS OF THE REPORT SHOWN BELOW:

ESIA Report:

A. Executive Summary:

This section will describe the project activities, critical environmental and social issues, significant findings and recommended actions.

B. Introduction:

This section will cover the following aspects:

i. Background of the project (In brief)
ii. Scope of the ESIA study
iii. Study methodology in details
iv. Limitation of the study

C. Policy, Legal and Administrative Framework

This section will cover the following aspects:

i. General
ii. Bangladesh Environmental Conservation ACT (ECA) 1995
iii. Bangladesh Environmental Conservation Rules, 1997
iv. Renewable energy Policy of Bang, 2008
v. Remote Area Power Supply Systems (RAPSS) guideline of 2007
vi. Bangladesh Labor Law, 2006
vii. National Biodiversity Strategy and Action Plan for Bangladesh, Ministry of environment and Forest, 2004
viii. World Bank's Guidelines on Environmental and Social Safeguards Policies
ix. ADB Guidelines on Environmental and Social Safeguards
x. JICA Guidelines on Environmental and Social safeguards
xi. Justification of the project on the basis of DOE, WB/ADB/JICA

D. Description of the Project:

This section will cover the following aspects:

i. Background and Rational of the Project
   - Information of the proposed project history;
   - Rationale for the proposed project;
   - Outline of the Project objectives;

ii. Project Site and Location
- Description of the location of the proposed project with maps (if site is an isolated island please describe all side lengths from the mentioned canal/ river/sea)
- Nearby communities, designated environmentally sensitive area and heritage sites (For solar mini grid buffer zone should be 1 km, cattle based farm or poultry based farm it should be 500 or 250 meters (depend on the farm size).

iii. Technical Aspects
- Description of the proposed project components
- Project equipment and civil works
- Provision of information on proposed emission, effluent and surface water erosion control technologies (If required)

E. **Baseline Environmental Condition (By assuming 1 Km/500m/250m radius air shed depends on the project)** *[Please note: Secondary data is enough for IEE report]*

i. Administrative Information
ii. Demographic Information
iii. Geological Condition
iv. Terrestrial Flora
v. Terrestrial Fauna
vi. Meteorological Condition (Rainfall, Temperature, Humidity, Wind speed) [at least 5 years' data need to be analyses]
vii. Air Quality [Please note: Air monitoring is depending on the locations' sensitivity]
- **The presence of SPM, SOx, NOx, CO, PM_{10}, $PM_{2.5}$**
- While measuring air quality- DOE approved technology is to be followed
- Conduct air dispersion model by an US EPA approved model

viii. Nosie Quality
- While measuring noise quality, DOE approved technology is to be followed
- There should be hourly monitoring of baseline noise according to the guideline of DOE and WB/ADB

ix. Surface and Ground water quality
- Surface: **(testing of: pH, TDS, DO, COD, BOD)**
- Ground: **(testing of: pH, Arsenic,TDS, alkalinity, Cl, Fe,)**

x. Project location from flood level
xi. Soil Quality
xii. Seismicity
xiii. Biological Environment (explain about Bio-ecological environment, Terrestrial Ecosystem, Protected areas and red book species)
xiv. Vulnerability to Climate Change and Natural hazard
- Explain in detail about how the project will be affected by the climate change impact
- Explain how the project is vulnerable to various natural calamities including flood, earthquake, drought, cyclone and so on

F. Baseline Socio-economic Condition

(For solar mini grid buffer zone, should be 1 km, cattle based farm or poultry based farm it should be 500 or 250 meters (depend on the farm size).

i. Distribution of population in the project area in terms of religion, age, sex, income occupation and their relevance with the project
ii. Physical and cultural resources (school, college, madrasha, mosque, temple, church etc.) in the project area

iii. Availability of Tribal settlement (if required)
iv. Communication facility

G. Analysis of Project Alternatives

i. Reason to choose the technology
ii. Site Alternative

H. Stakeholder Consultation and disclosure

The consultation will include key informant interview, focus group discussion (male & female) and public consultation. *The consultation will be documented with required facts, figures and evidence including participant list with contact details, photographs.*

I. Grievance Redress Mechanism

This section will describe the grievance redress framework

J. Anticipated Environmental and Social Impacts and Mitigation Measures

i. General
ii. Corridor of Impact (CoI)
iii. Pre-construction Phase
    - Land use
    - Flood Hazards
iv. Construction Phase, Operational Phase and Decommissioning Phase (Content in below for all phases)
    - Visual Amenity
    - Air Quality
    - Noise
    - Soil
    - Water Resources
    - Terrestrial Ecology
    - Waste Generation
    - Health and Safety
    - Employment Opportunities
    - Traffic
    - Archaeology and cultural resources
v. Summary of Anticipated Impacts

K. Environmental and Occupational Management Plan

This section deals with the set of mitigation management measures to be taken to avoid, reduce, mitigate or compensate for adverse environmental, occupational and social impacts with the institutional arrangement, monitoring schedule, parameters to be monitored and so on including tentative monitoring budget.

L. Environmental and Social Benefit

This section will discuss how the project will provide benefits in environmental sector and social life.

M. Conclusion

This section will provide the conclusion drawn from the assessment and provides recommendation

ANNEX 11: GUIDELINE OF INTRODUCING NEW PROJECT COMPONENT[9]

This harmonized ESMF is designed for the current project components under IDCOL REREDP . But in case of adopting/promoting/installing any new product/component under the purview of renewable energy, energy efficiency and so on, IDCOL will follow the following guidelines to ensure the EHS compliance associated with the product at an early stage of the project.

1. **Conduct an EHS Impact assessment:** IDCOL will engage a competent EHS Consultant to assess the EHS Impacts associated with the Project.
2. **Collection of secondary information:** The respective IDCOL official will collect secondary information about the EHS impacts associated with the Product.
3. **Consultation with relevant stakeholders:** IDCOL will prepare a compile observation based on the feedback of EHS Expert and its in-house experts. Thereafter, based on the findings of the compile version it will discuss with the following stakeholders (but not limited)
    - Academician: IDCOL will discuss with nationally reputed academicians having the relevant background about the technology of product. In addition, it will also discuss with reputed academicians having expertise on environmental impacts assessment.
    - Department of Environment: Being the prime government institute to deal with the environmental impact, IDCOL will discuss with the senior representative of DOE.
    - Development partners: IDCOL will discuss with the relevant experts of major development partners including WB, JICA, ADB and KfW.
4. **Information disclosure:** IDCOL will compile all the findings and feedback and will keep in its website for 30 days by announcing at least two national dailies, for general disclosure purpose.
5. **Compilation of feedback and formulation of the mitigation measures:** After compiling all feedback and responses, the relevant mitigation measures will be determined. The mitigation measures can be phasing such as immediate requirement, long term requirement. Immediate requirement includes the urgent health safety measures like awareness raising by media, handbill, leveling or general gathering. Long term requirement includes the technical aspects.

[9] This guidelines has been introduced in this ESMF to ensure better EHS management in future sub-projects/project components as will be implemented under REREDP of IDCOL.

ANNEX 12: GENDER ACTION FRAMEWORK[10] *(ADB)*

Tasks	Indicators	Responsibility
PLANNING and/or DESIGN PHASE		
Carryout gender and social analysis to inform the finalization of the detailed project report (DPRs) for the facility-financed subprojects with information and data on current patterns of women's involvement in the energy sector, including construction, and operation and maintenance of subproject-financed infrastructure. Include a dedicated social development expert, with gender-related expertise, local knowledge, and experience (3–6 person months, based on the complexity of the facility-financed subproject).	Consultation with community structures and/or groups, project-affected beneficiaries (% targets for women's participation to be developed)	IDCOL
CONSTRUCTION PHASE		
Provide separate facilities required for women at the construction site such as separate toilets, and childcare facilities in case of mother of under five-year children during construction and operation of infrastructure project. Provide equal wage rates for work of equal value for women and men laborers. Identify gender-responsive risk mitigation measures including addressing health and social impacts associated with large-scale infrastructure development (including sexually-transmitted infections, human trafficking). If adequate mitigation initiatives (supported by the Government, NGOs, and/or CBOs) are not in place, identify and budget mitigation initiatives accordingly. Include women in all awareness, training and capacity development activities.	Women employment opportunity (% targets to be developed) Record of wages paid shows no gender disparities for work of equal value Budget allocated for gender-related activities Gender-integrated mitigation measures implemented	IDCOL

[10] This gender action framework is provided by the ADB, which aims at promoting the incorporation of social and/or gender-related approaches and considerations in the design of facility-financed projects. It will guide the preparation of project-specific gender action plans—as needed—should their need arise during the preparation of the detailed project report. The framework builds on the Government's broader commitment to gender, including in the energy sector and promising practices developed by ADB in its support to the energy sector. The gender framework is not a substitute for any other safeguards' frameworks (i.e. resettlement, environment, and/or indigenous people's frameworks) which—by their nature—aim at specifically targeting affected people within the project area.

Tasks	Indicators	Responsibility
OPERATION PHASE		
Establish specific targets for women's employment during operation of infrastructure—based on the gender and social analyses conducted, baseline data collected, and in line with the Government's legislation and regulations, promising practices and—if feasible—adoption of gender targets. Implement gender-responsive Monitoring & Evaluation system whereby: (i) data are disaggregated by sex; (ii) indicators are established at the onset of implementation, monitored against baseline conditions and reported on a regular basis, focusing on improvements to quality of life parameters.	Consultations carried out (% targets for women's participation to be developed)	IDCOL
CAPACITY DEVELOPMENT PHASE		
Contribute to establish long-term capacity to monitor the social and gender-related impacts of subprojects, in line with internationally-established good practices. Develop a training module and gender sensitization training targeting the specific needs and constraints faced by the executing and/or implementing agencies, project monitoring units and/or project implementation units, corporation, and other relevant agencies on gender-related policies, strategies and practices.	Training carried out for the staff (% targets for women's participation to be developed) Training package includes gender session, and facilitated by social development experts	ADB

CBO = community-based organization, IDCOL= Infrastructure Development Company Limited, NGO = nongovernmental organization.

ANNEX13: ESIA SCREENING OF SOLAR IRRIGATION PUMP (WB)

[General Instruction: This screening report will be prepared by the proponent (sponsor) and will be reviewed by IDCOL along with field verification. Softcopy should be available to proponent for required space to describe different sections. Please refer Annex-14 for general standards of irrigation water quality.]

a) Subproject Title/Location:

b) Proponent(s):

c) Project Description

*(*General Note: The solar irrigation pump will be usually installed at that site where the existing irrigation facilities are being operated by the diesel engine. The solar energy with PV systems has a smaller environmental footprint compared to conventional power systems. However, the irrigation and drainage activities may result some negative environmental impacts. This impact may extend both upstream and downstream of the irrigated area. It is necessary to determine the impacts and take measures to mitigate/compensate the impacts.*)*

Brief description of the followings:

- *Project's main objective*
- *Source of water- ground or surface*
- *Components of the project (Please attach physical layout in Annex)*
- *Areas (ha) to be covered under irrigation*
- *Size (sq. m) of the control buildings*
- *Capacity of solar system (watt)*
- *Maximum yield of pump (cu. m/s)*
- *Size storage reservoir (Length, breath and height in m)*
- *Maximum volume of water (cu.m per day) required in a given period of time in dry season.*

d) Existing Environment

Description of the environmental components as indicative below on and surrounding the project site:

- *Lowest ground water table in the locality during dry period (Information from DPHE/ LGED. This information is required only if ground water will be used for irrigation.)*
- *Rate of ground water lowering (If available from DPHE/ LGED/other source. This information is required only if ground water will be used for irrigation.)*
- *Availability (Flow in cu.m/s and/or water depth) of water of the selected surface water source during dry season (This information is required only if surface water will be used for irrigation.)*
- *The quality (mainly arsenic) of available water sources (Test report of nearest tube-wells. This information is required only if ground water will be used for irrigation.)*

Project Location	No. of tube-well within 200m radius/nearby village	Tubewell tested to measure arsenic level		Marking (Green/Red)	Arsenic level in red marked tubewells
		Yes	No		(mg/L)

- *Surrounding environment: Indicate presence of forest, wetlands, creeks, streams, undeveloped areas, residential areas, industrial areas, environmentally sensitive areas, recognized or protected area etc. within 200m periphery of the project command area.*
- *Existing crop cultivation practice in the project area*
- *The gradient of the project area*
- *Existing drainage facilities*

e) Environmental Screening Questionnaire

(General Note: The environmental Screening will be done to identify and examine the environmental effects of the proposed project determine the likely significance of the environmental effects as well as identify appropriate mitigation measures to reduce, eliminate, compensate for, or control these effects.)

Does the project effect	***Yes/No***	***If yes, how***
Will the proposed project support the cultivation of existing crop fields?		
Will the proposed project require land-filling for construction of control structure, storage reservoir and setting-up the solar panel?		
Will the project use the existing irrigation channels?		
If the answer of the above question is no, whether new channels (irrespective of financing) will be constructed?		
Will the drainage channel cross any road?		
Will the irrigation lead to water logging in adjacent land?		
Will the proposed activities impact on natural habitat and environmentally sensitive areas?		
Will the proposed construction, installation, operation, modification, replacement of water pipe, stream line be located alongside or underneath any physical cultural sites?		
Is there any future possibility to use the irrigation water for drinking purposes of the local community?		
If yes, will the water quality of the source meet the national drinking water quality?		
Will the project cause physical changes in the locality such as topography, land use, water bodies, and physical cultural resources?		
Will the proposed project put any significant negative effects on surrounding water, air or noise quality?		
Will the communities require awareness or training program on proper use and maintenance of solar energy plants		

f) Screening Decision

(General Note: Please review the environmental screening and summarize the environmental impacts. Suggest the next step including the Environmental Management Plan)

g) Environmental Management Plan

(General Note: Environmental Management Plan has two parts: Environmental Mitigation Plan and Environmental Monitoring Plan)

1) Environmental Mitigation Plan

Sub-project Activity	Potential Environmental Impact(s)	Mitigation Measures	Location	Estimated Mitigation Cost	Responsibility	
					Implementation	Supervision
Pre-construction Phase						
Construction Phase						
Operation Phase						

2) Environmental Monitoring Plan (Mitigation Monitoring):

A) MITIGATION MONITORING							
Environ-mental Indicator	Parameters/ Units	Location	Means of Monitoring	Frequency/ Duration Standards	Responsibilities		Estimated Cost
					Implemen-tation	Supervision	

h) Environmental Monitoring Plan

Monitoring will be conducted for the following aspects as per the table below:

Monitoring Issue	Frequency	Monitored by	Supervised by
Whether the water is being used for drinking purposes			
Whether any water logging has occurred due to improper maintenance of the system			

i) Public Consultation

(Instruction: Please attach the notes of the consultation held earlier with the farmers regarding the solar irrigation system and their willingness to adopt the technology and cost involvement as an Annex to the screening report. The consultation notes must be supported by signature/thumb print of the participants. Photographs of such meeting will be encouraged)

a) Social Screening Questionnaire

Does the project effect	***Yes/No***
Involuntary Resettlement Aspect	
Is any land acquisition required for the project?	
Type of land (public, private or lease)	
Is there any settlement present in the site?	
Is there any recorded litigation issue associate with the site?	
Is there any close relationship between the general livelihood pattern and the site in the project area?	
Does the project require physical or economic displacement of any person/household/community?	
Tribal People Aspect	
Is the project site located in tribal people prone area?	
Is there any impact of the project on religious and cultural practice and belief of tribal people?	
Is there any impact of the project on livelihood pattern of tribal people?	
Is there any settlement recorded (present and near past) in the site?	
Is there necessity of displacing (physically or economically) any person/household/community?	
What local language(s) is (are) used by the IP population?	

(Appropriate mitigation plan will be developed based on the results of the Social Screening.)

Screening Report Prepared by (Name of the proponent official/consultant): ……

Designation:
……

Date: ……

Screening Report Reviewed & Cleared by (Name of the IDCOL official/consultant): ……

Designation:
……
……..

Date: ……

ANNEX 14: GENERAL STANDARD FOR IRRIGATION WATER (WB)

(VARIES WITH CROP TYPES)

1. Salinity (Salt Content)

Specific conductivity: should be less than 3 mmhos/cm

Total Dissolved Solids: should be less than 2000 mg/l

2. Salinity (Cations and Anions)

Sodium: should be less than 40 me/l

Bicarbonate: should be less than 10 me/l

Chloride: should be less than 30 me/l

Sulphate: should be less than 20 me/l

3. Nutrients

No_3-N: should be less than 10 mg/l

Ammonium-Nitrogen: should be less than 5 mg/l

Phosphate-Phosphorous: should be less than 2 mg/l

4. Miscellaneous

Boron: should be less than 0.2 mg/l

pH: should in the range of 6.5 to 8.4

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mg/l = milligram per liter = parts per million (ppm)

me/l = milliequivalent per liter (mg/l ÷ equivalent weight = me/l)

ANNEX 15: SECREENING CRITERIA AND RESPONSIBILITIES OF PROJECT SPONSOR (JICA)

Screening Criteria for the Selection of Appropriate Sub-Projects

- The sub-project shall observe related environmental laws and regulations including “The Bangladesh Environment Conservation Act, 1995”, “The Environment Conservation Rules, 1997” and “Lead Acid Battery Recycling and Management Rules (Statutory Regulatory Order No. 175-Act/2006)”.
- The sub-project categorized as “Category A” in “JICA Guidelines” will be rejected in JICA-REDP.
- The sub-project required EIA in obedience to “The Environment Conservation Rules, 1997” including Red category project will be rejected in JICA-REDP.
- The sub-project shall not require physical relocation.
- The sub-project shall not require clearing of natural forest.
- The biomass gasification sub-project shall take proper countermeasures to prevent health disturbance through the production of smoke, dust, ash and tar.

Role of IDCOL

- IDCOL conducts the environmental screening on the basis of the environmental screening form (later attached) prepared by the PO or sponsor and field surveys to examine the potential positive and negative environmental and social impacts and identify whether the sub-project is categorized as “Category A” in “JICA Guidelines” in the appraisal stage.
- IDCOL submits the screening form and a series of the reports on the results of the screening and scoping including the categorization in the appraisal stage, and the environmental monitoring in the operation phase to JICA.
- IDCOL supervises and supports the legal environmental procedure of the PO or sponsor.

Obligation of PO or sponsor

- The PO or sponsor prepares the environmental screening form (later attached) and submit the form to IDCOL.
- The PO or sponsor conducts the environmental procedure regulated in relevant laws and reports the progress and results to IDCOL.
- The PO or sponsor conducts the environmental monitoring and submit the results to IDCOL.

ANNEX 16: POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT AND MITIGATION MEASURES (JICA)

These potential environmental and social impacts were assessed on the basis of general and typical conditions.

a) SHS Program

Impact Item	Impact	Mitigation Measures
Waste	**Operation Phase:** Old batteries will be collected and recycled. However, because the informal sector has been concerned in the collection, old batteries may remain in inappropriate sites.	IDOCL has prepared "Policy Guidelines on Disposal of Warranty Expired Battery". The customers, POs, and manufactures should observe the Policy fully. In order to identify battery collection conditions, periodic monitoring should be conducted.
Accidents	**Operation Phase:** Risk of accidental electric shock	The POs should instruct basic knowledge on electricity to the customers.
GHG Emission	**Operation Phase:** During operation phase, there is emission of GHG	Proper mitigation and compensation measures are required

b) Solar Irrigation Pump Component

Impact Item	Impact	Mitigation Measures
Ecosystem	**Construction Phase:** Impact on ecosystem will not occur in ordinary circumstances. However, tree clearing may be required depending on project site.	Sub-projects requiring clearing of natural forest should be rejected in the appraisal stage.
Hydrology/ Water usage	**Operation Phase:** Excessive water use may cause impact on hydrology.	The project proponent or agricultural group should prepare a proper water pump-up and use plan reference from experience in the surrounding areas and results of hydrological surveys.
Resettlement/ Land Acquisition	**Pre-Construction Phase:**Resettlement is unlikely to be required in ordinary circumstances. However, land acquisition may be required depending on project site.	Sub-projects requiring involuntary resettlement should be rejected in the appraisal stage. Proper compensation for the lost land should be paid to the affected persons.

Poor people	**Operation Phase:** Impact on poor people may occur depending on water fee and project site.	The project proponent or agricultural group should set a proper payment method reference from experience in the surrounding areas. The payment method should be reviewed in the appraisal stage.
Land use	**Construction Phase:** Shift of land use from agricultural land to PV generation site may be required depending on project site.	Proper compensation for the lost land should be paid to the affected persons.
Social institutions/ Misdistribution/ Local conflicts	**Operation Phase:** Without a steady agricultural group and a proper water allocation or management plan, conflict among local decision-making institutions and users in maintenance works and cost for irrigation system may occur.	The project proponent or agricultural group should formulate the water allocation and management plans reference from experience in the surrounding areas. The plans and capacity of the responsible group to maintain the irrigation system should be reviewed in the appraisal stage. In case of a new installation of an irrigation system, its operation and maintenance should be periodically monitored. In case of replacement of existing diesel pumps, the basic agreement among the existing users should be provided in the appraisal stage.

c) Solar Mini-Grid Component

Impact Item	Impact	Mitigation Measures
Ecosystem	**Construction Phase:** Impact on ecosystem will not occur in ordinary circumstances. However, forest clearing may be required depending on project site.	Sub-projects requiring clearing of natural forest should be rejected in the appraisal stage.
Resettlement/ Land Acquisition	**Pre-Construction Phase:** Land acquisition will be required around marketplace. Involuntary resettlement may be required depending on project site.	Sub-projects requiring involuntary resettlement should be rejected in the appraisal stage. Proper compensation for the lost land should be paid to the affected persons.

Misdistribution/Local conflicts of interest	**Operation Phase:** In case of low supply capacity to demand, misdistribution will occur.In case of big difference between existing electric rate and solar mini-grid electric rate, conflict among users may occur.	The project proponent should install facilities with sufficient capacity and decide the proper rate. The capacity and rate should be reviewed in the appraisal stage. Its operation and maintenance should be periodically monitored.

d) Gasification of Biomass Component

Impact Item	Impact	Mitigation Measures
Air pollution Working conditions (including occupational safety)	**Operation Phase:** Smoke from biomass gasification plant may cause air pollution. The smoke and dust may include hazardous substances and cause health disturbance to the workers.	The project proponent should install highly efficient precipitation (smoke treatment) equipment and/or filter system. The capacity and specification should be reviewed in the appraisal stage. The smoke and dust levels, precipitation equipment, filter system, and health condition of the workers and local people should be monitored periodically.
Ecosystem	**Construction Phase:** Impact on ecosystem will not occur in ordinary circumstances. However, tree clearing may be required depending on project site.	Sub-projects requiring clearing of natural forest should be rejected in the appraisal stage.
Utilization of local resources Local conflicts of interest	**Operation Phase:** In case of rice husk gasification, since the biomass gasification can be used as fuel, compost, cattle feed, or bedding materials in poultry farms, impact on the existing use and conflict among rice husk usersmay occur.	The project proponent should prepare a proper procurement plan of the rice husk without impact on the existing use. The procurement plan should be reviewed in the appraisal stage.

e) Biogas Power Generation Component

Impact Item	Impact	Mitigation Measures

Water pollution	**Operation Phase:** Because waste water will be digested in the system, the environmental load will be reduced. However, improper slurry management may cause water pollution.	The project proponent should install sufficient facilities and conduct the proper maintenance.
Accidents	**Operation Phase:** Accidental gas explosion by insufficient facilities or inadequate operation	The project proponent should install sufficient facilities. The management staff should give the operators training on the safety measures. The design of the facilities should be reviewed in the appraisal stage.

ANNEX 17: ENVIRONMENTAL SCREENING FORM (JICA)

(fromhttp://www.jica.go.jp/english/our_work/social_environmental/guideline/ref.html)

Name of Proposed Project:

Project Executing Organization, Project Proponent or Investment Company:

Name, Address, Organization, and Contact Point of a Responsible Officer:

Name:
Address:
Organization:
Tel:
Fax:
E-Mail:
Date:
Signature:

Check Items

Please write “to be advised (TBA)” when the details of a project are yet to be determined.

Question 1: Address of project site

Question 2: Scale and contents of the project (approximate area, facilities area, production, electricity generated, etc.)

2-1. Project profile (scale and contents)

2-2. How was the necessity of the project confirmed?

Is the project consistent with the higher program/policy?

□YES: Please describe the higher program/policy.

（ ）

□NO

2-3. Did the proponent consider alternatives before this request?

□YES: Please describe outline of the alternatives

（ ）

□NO

2-4. Did the proponent implement meetings with the related stakeholders before this request?

□Implemented □Not implemented

If implemented, please mark the following stakeholders.

□Administrative body

□Local residents

□NGO

□Others（ ）

Question 3:

Is the project a new one or an ongoing one? In the case of an ongoing project, have you received strong complaints or other comments from local residents?

□ New □ Ongoing (with complaints) □Ongoing (without complaints)

□Other （ ）

Question 4:

Is an Environmental Impact Assessment (EIA), including an Initial Environmental Examination (IEE) Is, required for the project according to a law or guidelines of a host country? If yes, is EIA implemented or planned? If necessary, please fill in the reason why EIA is required.

□Necessity (□Implemented □Ongoing/planning)

(Reason why EIA is required:)

□Not necessary

□Other (please explain)

Question 5:

In the case that steps were taken for an EIA, was the EIA approved by the relevant laws of the host country? If yes, please note the date of approval and the competent authority.

□Approved without a supplementary condition	□Approved with a supplementary condition	□Under appraisal

(Date of approval: Competent authority:)

□Under implementation

□Appraisal process not yet started

□Other ( )

Question 6:

If the project requires a certificate regarding the environment and society other than an EIA, please indicate the title of said certificate. Was it approved?

□Already certified

Title of the certificate: ( )

□Requires a certificate but not yet approved

□Not required

□Other ( )

Question 7:

Are any of the following areas present either inside or surrounding the project site?

□Yes□No

If yes, please mark the corresponding items.

□National parks, protection areas designated by the government (coastline, wetlands, reserved area for ethnic or tribal people, cultural heritage)

□Primeval forests, tropical natural forests

□Ecologically important habitats (coral reefs, mangrove wetlands, tidal flats, etc.)

□Habitats of endangered species for which protection is required under local laws and/or international treaties

□Areas that run the risk of a large scale increase in soil salinity or soil erosion

□Remarkable desertification areas

□Areas with special values from an archaeological, historical, and/or cultural points of view

□Habitats of minorities, tribal people, or nomadic people with a traditional lifestyle, or areas with special social value

Question 8:

Does the project include any of the following items?

□Yes□No

If yes, please mark the appropriate items.

□Involuntary resettlement (scale: households persons)

□Groundwater pumping (scale: m3/year)

□Land reclamation, land development, and/or land-clearing (scale: hectors)

□Logging (scale: hectors)

Question 9:

Please mark related adverse environmental and social impacts, and describe their outlines.

□ Air pollution

□ Water pollution

□ Soil pollution

□ Waste

□ Noise and vibrations

□ Ground subsidence

□ Offensive odors

□ Geographical features

□ Bottom sediment

□ Involuntary resettlement

□ Local economies, such as employment, livelihood, etc.

□ Land use and utilization of local resources

□ Social institutions such as social infrastructure and local decision-making institutions

□ Existing social infrastructures and services

□ Poor, tribal, or ethnic people

□ Misdistribution of benefits and damages

□ Biota and ecosystems

□ Water usage

□Accidents

□Global warming

□ Local conflicts of interest

□ Gender

□ Children's rights

□ Cultural heritage

□ Infectious diseases such as HIV/AIDS

□ Other ( )

Outline of related impact:

( )

Question 10:

In the case of a loan project such as a two-step loan or a sector loan, can sub-projects be specified at the present time?

□Yes □No

Question 11:

Regarding information disclosure and meetings with stakeholders, if JICA's environmental and social considerations are required, does the proponent agree to information disclosure and meetings with stakeholders through these guidelines?

□Yes □No

Categorization in screening phase: □A □B □C

(This categorization will be reviewed in next phase.)

Note: PO or sponsor will primarily fill-up this screening form and IDCOL will review through field visit.

ANNEX 18: SAMPLE ENVIRONMENTAL SCOPING FORM (JICA)

(It is possible to modify this form or adopt other forms depending on characteristics of the sub-project.)

No.	Impact Item	Assessment		Reason / Remarks
		Pre-Construction andConstruction Phase	Operation Phase	
Pollution				
1	Air pollution			
2	Water pollution			
3	Waste			
4	Soil pollution			
5	Noise and vibration			
6	Ground subsidence			
7	Offensive odors			
8	Bottom sediment			
Natural Environment				
9	Protected areas			
10	Ecosystem			
11	Hydrology			
12	Geographical features			
Social Environment				
13	Resettlement/ Land Acquisition			
14	Poor people			
15	Ethnic minorities and tribal peoples			

16	Local economies, such as employment, livelihood, etc.			
17	Land use and utilization of local resources			
18	Water usage			
19	Existing social infrastructures and services			
20	Social institutions			
21	Misdistribution of benefits and damages			
22	Local conflicts of interest			
23	Cultural heritage			
24	Landscape			
25	Gender			
26	Children's rights			
27	Infectious diseases such as HIV/AIDS			
8	Working conditions			
29	Accidents			
Other				
30	Trans-boundary impacts or climate change			

A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.

C+/-: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)

D: No impact is expected

ANNEX 19: SELECTED POINTS OF EHS COMPLIANCES FOR SUB-PROJECTS "OTHER RENEWABLE ENERGY COMPONENTS" (KfW)

Mini-grid Projects:

- IDCOL should require a recycling plan from the sponsor, which includes a binding recycling mechanism for batteries. The implementation of the recycling needs to be monitored by IDCOL.

Solar irrigation Projects:

- IDCOL must include the findings of water quality (including salinity, arsenic contamination, etc) in the appraisal document, control the salinity / level of contamination during monitoring visits and refuse locations where the water is saline or not safe for use.
- During the appraisal process and before the final sizing of the pump, IDCOL should evaluate the amount of water which can sustainably be drawn from the ground water. The size of the PV panel needs to be selected accordingly.
- The environmental analysis cannot only rely on interviews with the local population, as substantial expertise is needed to evaluate the local environmental impact.

Bio-gas based power plant:

- IDCOL should require a comprehensive slurry management plant. The implementation should be monitored on a regular basis (e.g. upon commissioning of the plant, after 6 months, after 2 years, after 4 years etc.).
- Furthermore, a fertilizer plant should be in place or constructed within the first 6 months of operation. Alternatively, a purchase agreement with a fertilizer company for the slurry should be required as part of the appraisal process.
- Monitor the soil quality in areas where organic fertilizer is applied.
- Analyse the environmental side-effects of poultry farms in Bangladesh. It is recommended to include only smaller farms (e.g. up to 50,000 animals) under the programme to mitigate the local environmental impact of large-scale poultry farming, and to examine the space and living conditions of the animals as part of the appraisal process.

ANNEX 20: TRIBAL PEOPLES DEVELOPMENT FRAMEWORK

Rural Electrification and Renewable Energy Development Project (REREDP) of Infrastructure Development Company Limited (IDCOL) is aimed at increasing access to clean energy in rural areas through renewable energy. The project supports: (i) increased access to electricity in rural areas through renewable energy through solar home systems and other options; (ii) large-scale dissemination of more efficient cook stoves and fuels for cooking; and (iii) improved technical and institutional efficiency in the power sector. The proposed additional financing (AF) will contribute towards increasing access to electricity in remote rural areas where grid electricity is not economically viable.

The Solar Home Systems (SHS) program of Bangladesh supported by the World Bank is emerging as a viable electrification option for lighting and other basic services in areas without grid access. SHS are being installed under the ongoing renewable energy project and the proposed RERED-II AF will continue this support. Further the commercial needs of the rural markets and small enterprises would be served by mini grid renewable energy sources under the Remote Area Power Supply Systems (RAPSS) Guidelines of 2007. The RERED-II AF will also support clean cooking options for households through improved cook stoves (ICS), advanced combustion stoves, and biogas. In addition, IDCOL is supporting to solar-irrigation pump, solar mini-grid, biogas and biomass based power projects to ensure sustainable development.

Table: IDCOL's REREDP services with target

Project/Program	Target (number with year)
Improved Cook Stove Program (ICS)	5 million by 2021
Solar Irrigation Program (SIP)	3,000 by 2021
Solar Mini Grid (SMG)	70 by 2021

WORLD BANK'S SAFEGUARDS: RELEVANT POLICIES

IDCOL and all relevant development partners and stakeholders participating in REREDP have agreed to adopt harmonised ESMF, which defines the environmental and social requirements needed for processing the financing of each sub-component which is incompliant with all the applicable environmental and social legislation of the Government of Bangladesh (GOB). The project is designated as category B in the document, according to OP/BP of the World Bank. The environmental safeguard policy OP/BP 4.01 has been triggered as it is expected that all the components will be in green category and only the Mini-Grid will be Orange3 category. The Project will not allow any type of involuntary resettlement or adverse impacts to Indigenous People (IP). Therefore OP 4.12 has not been triggered for the project.

The Indigenous Peoples Policy OP 4.10 which was not triggered in the previous phase has been triggered for the current one based on findings that the project areas include IP beneficiaries. IDCOL established the Environment and Social Safeguards Management Unit

(ESMU) in their regular organogram to institutionalize the environmental and social management in its operation

IDCOL will have to follow OP4.10 and take necessary actions for awareness rising, mobilization and training campaigns tailored to the needs of IPs in the relevant locations so, that the statutory rights and privileges and their customs and norms of the IP are not hampered or disturbed rather adequately complied with. All awareness raising, mobilization and training campaigns must be tailored to the needs of IPs in the relevant locations. For this purpose, proper screening of the IPs in the IP concentrated areas or IPs in mainstream population areas need proper screening for identification of IPs and project based specific brief social assessment needs to be carried out.

Implication of WB Policy: Sub-project specific environment and social screening, and if necessary, appropriate mitigation plans to be prepared and implemented. IDCOL will review each screening/assessment and will regularly monitor the implementation of environment and social management plan and the IPPF.

2. Indigenous Peoples (IP)/ Tribal People (TP) in Bangladesh:

The current Indigenous Peoples policy (May 2005) recognizes the distinct identities and cultures of Tribal Peoples are inextricably linked to the lands on which they live and the natural resources on which they depend. The policy requires client governments to seek broad community support of Tribal Peoples through a process of free, prior, and informed consultation before deciding on development projects affecting Tribal Peoples.
In Bangladesh, IPs are often referred to as small ethnic groups, ethnic communities, tribal, hill people (paharis) and forest people. For the purposes of this document IPs will be referred to as tribal people (TPs) as per government definition.

Bangladesh has roughly 85 percent Muslim population, others are mainly Hindu, Buddhist and Christian. More than 99 percent speak Bengali. Despite the homogeneity of people as a Bengalination, the Chittagong Hill Tracts (CHT) comprising the districts of Rangamati, Khagrachhari and Bandarban has a significant number of ethnic minorities **(0.45 percent of the total population of Bangladesh)** who belong to the 'mongoloid group' and live in a geographically compact area. Three major tribes are the Chakma, Marma and Tripura. They constitute more than88 percent of the total number of TPs in the CHT. Other tribes are Tanchangya, Mro,Bawm,Pankhua, Chak, Kheyang, Lushai and Khumi. The primary census report of 2011 illustrates that total ethnic population group of Bangladesh 1st is Chakma consisted 4,44,748 people while the Marma, the second largest ethnic group compares with 2,02,974 person.

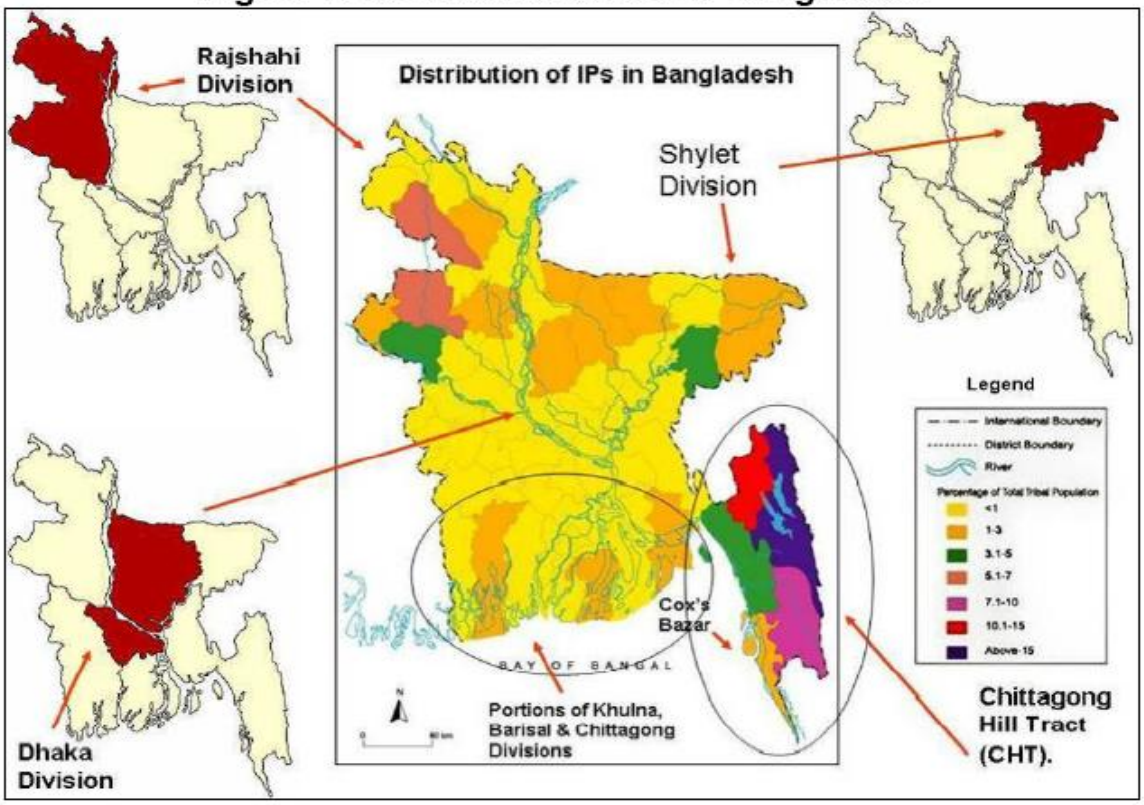
Other than CHT, some other ethnic groups are inhabitants in NorthWest part of the country, Mymensingh and Sylhet regions. In these regions the tribal population is scattered and has become mixed with the mainstream Bengali population. In Southeast there are Rakhains whose origin is Myanmar but many currently live in Cox'sbazar.

Table 1: Areas of TP Concentration in Bangladesh

	Areas of TP Concentration	**Predominant TPs**	**% National TPs**	**% of District Populations**
	Plains			
1.	Rajshahi Division, Naogaon, Dinajpur Rajshahi, &Joypurhat Districts	Santal, Munda and Oraon	36	4
2.	Sylhet Division, Maulavibazar and Hobigonj Districts	Khasia, Manipuri, Patro, Garo and Tripura	8	3
3.	Madhupur Area of Dhaka Division	Garo/Mandi	7	2
4.	Patuakhali (Barisal Division) and Cox'Bazar (Chittagong Division) Districts	Rakahain	6	
5.	Khulna Division, in *Sundarbans*	Munda	2	
	Hills			
6.	Chittagong Hill Tracts	Chakma, Marma, Tripura and others	41	44
	Total		100	

Source: Bangladesh Bureau of Statistics (BBS), 2001

Figure 1: Distribution of IPs in Bangladesh



3. TRIBAL PEOPLE'S POLICY FRAMEWOK:

Identifying the Tribal Peoples:

Although the TPs of Bangladesh are well recognized locally, the IDCOL and POs will examine the following characteristics to make formal identification:

- Self-identification as members of a distinct tribal cultural group and recognition of this identity by others;
- Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
- Customary cultural, economic, social or political institutions that are separate from those of the dominant society and culture; and
- A tribal language, often different from the official language of the country or region.

Impact Mitigation & Development Measures:
Consultation Strategy

The experience of the previous project has been found to be significantly beneficial to all consumers, including IPs. The services under the project are available to all willing customers on a purely commercial basis. Since the partner organizations (POs) aim to reach as many customers as possible to increase their market, there is little scope for exclusion; in fact POs have been proactive in communicating with people as a

marketing strategy. To avoid or minimize adverse impacts and, at the same time, ensure benefits for TPs, IDCOL will have to apply the following basic principles in selection and design of particular activity:

- Ensure that TP communities in general and their organizations are not excluded by any means in activities selection, design and implementation processes.
- Together with TPs, carefully screen the activities for a preliminary understanding of the nature and magnitude of potential impacts, and explore alternatives to avoid or minimize any adverse impacts.
- IDCOL will undertake the necessary tasks in order to adopt an intensive consultation and communication strategy with the tribal communities, community elders/leaders, and formal and informal tribal organizations, civil society organizations like NGOs/CBOs/VOs, and others who are interested in and have knowledge of TP issues.

Consultation will include the activity objectives and scope; the likely key adverse impacts on (and benefits for) TPs; TPs' own perception of the impacts and feedback; and a preliminary assessment of opportunities which IDCOL could promote – in addition to mitigation of the adverse impacts.

All project activities are neutral towards providing benefits to the general people, but an awareness campaign in local/ethnic languages (including posters, workshops etc.) can enhance positive outcomes for TPs especially.

As required for informed consultation, and dissemination of information, IDCOL and POs concerned institutes will provide TPs with all activity-related information, including that on potential adverse impacts if any. To facilitate consultation, IDCOL and POs may

- Prepare a time-table for dialogues during activity selection, design and implementation processes, and consult them in a manner so that they can express their views and preferences freely in case of activities may affect access to common property and resources.
- In addition to the communities in general, consult TP organizations, community leaders and others with adequate gender and generational representation; and civil society organizations like NGOs and groups knowledgeable of TP issues about the impacts of the services.

IDCOL will screen the project activities to ensure compliance with the above principles. For location specific sub-projects that trigger OP 4.10, adequate and appropriate consultation modalities are to be adopted to build consensus among the Tribal population, identify impacts in the light of their unique needs and way of life and implement mitigation measures commensurate with their cultural, religious and societal norms.

Access and inclusion issues: The services of Solar Home Systems (SHS) and Household Energy components are individual schemes and can be purchased from the market. These are providing and ensuring equal access to all the households including

TP HHs. Thus, there is no scope of negative impacts these population rather as they are benefited from the alternative energy sources where electricity is not available from national grid, they are immensely benefited.

The Mini- grid and the irrigation projects will need community involvement and as the participations are voluntarily there is no possibility of adverse impact or discrimination. However, careful observation needed with prior consultation and information dissemination before implementation of such projects so that TPs do not lose access to common properties or resources.

As mentioned earlier no Tribal lands will be acquired and no involuntary resettlement will be needed, there will be no negative impact on Tribal land owners. During any need for land purchase, careful verification by IDCOL will be needed for clarification of the status of the land.

Future screening and monitoring:

The social screening format attached will be relevant for all project components. The project will not undertake any sub-project that triggers land acquisition or any kind of displacement (physical or economic) from public or private lands regardless of their title. No adverse impacts on IPs, through impacts on land or livelihood are permissible under the project.

For all projects screening and assessment should be done for avoiding any adverse impact on TPs rather for positive benefit to reach these population. However as there is open access and no provisions taken to have any adverse impacts on TP population and the activities are in compliance with World Bank's and relevant government policies, IDCOL need to prepare project specific Abbreviated/brief SMF to make sure of their compliance with the required policies for all projects.

Currently there is provision for meetings with the mini-grid plants for assessing the environmental and health safety issues as this component is identified as Orange 3. All other components are expected to be green and have no negative environmental and health safety impacts. Similarly to assess the social safeguards compliance, IDCOL officials will meet with the POs half-yearly meeting with all POs and POs submit their reports of social safeguard issues to IDCOL who then can upload it on their web for dissemination for 3 weeks and send notification emails to the Development Partners.

Currently IDCOL officials are provisioned to visit 2 POs half yearly, there are 47 POs. As per this framework it will visit to 3 POs quarterly to cover 25% of all POs. They IDCOL officials will have consultation with the locals including project beneficiaries to make it participatory and ensure consultation and dissemination of knowledge.

IDCOL needs to ensure these are followed as agreed.

SHS, bio-gas plant for cooking and ICS services under the predecessor RERED project and the on-going RERED II project have brought significant positive changes in the lives of beneficiaries living in the rural and remote off-grid areas. As the project covers all off-grid areas of the country, many IPs could access the services provided by the POs. The SHS has vastly increased women's safety, mobility and entrepreneurial ambitions. It has enabled thousands of

children to study properly at night and do better in school. Similarly, biogas plants for cooking have provided rural women with access to clean energy thus bringing positive impacts on women's health and safety as well as conserving environment by reducing carbon emissions caused by traditional stoves. The third product, the ICS produces less smoke and is more energy efficient and thus can be a welcome change. IDCOL is in an advanced stage of financing six mini-grid projects. The location of one mini-grid project is at Kutubdia Island, Cox's Bazar which has IP inhabitants. IDCOL conducted extensive consultation with IP communities to ensure that there is no negative impact. IDCOL follows a detailed checklist to ensure that IPs are benefitted by the Project. Moreover, IDCOL has financed about 35 solar irrigation projects. In IP inhabited areas, IP women engage in agriculture. The mini-irrigation projects will help IP men and women to ease the irrigation of their field.

As no negative impacts on IPs are expected and no negative impacts on livelihoods or land taking is permissible under the project, the Tribal Peoples Framework and subsequent Plans will be focused on inclusion, consultation and communication. A consultation and communication plan will need to be prepared and implemented to clearly disseminate project information and gather feedback regarding the needs and priorities of IPs so that awareness raising, training etc. can be properly adapted.

As per the Screening Format, if any sub-project area identifies IP populations living within it, the relevant PO will immediately engage a communication person from within its organization who is from the local area (an IP person is preferred) who is conversant in the local language and is aware of the norms, customs and lifestyle of the IP populations and prepare a TPP consisting of an inclusion and communication strategy. The consultation and communication strategy will focus on:

- Identifying how the services offered by the PO can enhance the lives of the IPs given their understanding of their lifestyles, market conditions, livelihood trends
- Identifying methods to best reach the IPs and disseminate information in a culturally appropriate and gender sensitized manner
- Ensure that women are reached and fully understandthe benefits of the products, but also understand all safety implications of the products (especially for the cook-stoves).
- Ensuring that correct and full information is disclosed regarding the project, the particular services being offered by the PO, with especial attention to the details of the terms and conditions of the transaction
- Ensuring complete clarity on messaging regarding not only the benefits of the service/product, but how to properly and safely use and maintain it with full disclosure on maintenance costs associated with the service/product and where to go if the product/service malfunctions or is disrupted in any way
- Maintaining a link with the IP customers to garner their feedback and help address their complaints if any
- Assist in registering complaints if any via the established Grievance Redress Mechanism or more informally with the POs if possible

Communication, documentation and dissemination of information: The communication process must be carefully documented by the project proponents, including keeping photographs and participant's lists. All sessions and communications modes must be in local languages and follow the customs and norms of local communities. The third-party monitoring mechanism will assess the safeguards compliance on a yearly basis.

It is expected that the components under the REREDP interventions yield positive social and environmental impacts. No negative impacts on IPs in terms of land acquisition or livelihoods or maintaining their cultural way of life is permissible under the project. Any sub-project seen to be triggering the above via the social screening will not be considered under the project.

In order to ensure no negative impacts accrue, the project will:

- Strengthen IDCOL's capacity for environmental and social safeguard management;
- Ensure proper awareness and arrangement to mitigate the environmental and health hazard due to improper management and disposal of CFL bulbs;
- Disclose the updated ESMF in the website of IDCOL as well as all relevant stakeholders;
- Disclose the summary of the updated ESMF in Bengali in IDCOL website.
- Disclosure of the IPPF in the IDCOL website.

Grievance Redress Mechanism

IDCOL has adopted a method for addressing grievances in this project. All customers relevant to all sub-projects are given the contact numbers for IDCOL Customer Care Center which is staffed by male and female members. All complaints are recorded and a computerized documentation process shows exactly which complaints have been resolved and which require follow-up. Complaints are then registered at the relevant branch offices where they are resolved. If the complaint is not resolved at this stage the complainant is directed to the head of the project proponent agency at the monthly Operational Committee Meetings where all senior officials of all project proponent agencies are required to be present. In the rare event that complaints are not resolved at this stage also, the customer is free to go for legal action. Same procedure is suggested to be followed in the areas of IP population.

IDCOL has established an independent Environment and Social Safeguards Management Unit (ESMU) to institutionalize the environmental and social management in its operation.

Institutional Arrangements

The social screening will be conducted by the POs and findings submitted to IDCOL before permission/license is given to the POs to go ahead and market or sell the services/products. Once IDCOL checks the screening and allows the POs to proceed; the latter will prepare a TPP consisting of an inclusion and communication strategy. The communication modality described above will be implemented by the POs. This has largely been covered in the previous phase of the project as well as part of the PO's marketing strategy but will now follow a more methodical and well-documented process covering the aspects mentioned above as well as any new issues which are found during the consultations. As part of their monitoring activities IDCOL will visit 25% of all POs annually, but will ensure that all POs dealing with IP populations are covered. IDCOL will check all relevant documentation including TPPs - communication materials used, photographs, participant's lists in listed consultations etc.

Access to Information: The IPPF will be made available in the website of IDCOL and other stakeholders. In addition, there will be IPPF written in Bengali language and available in the website.

ANNEX 21: REVIEW OF EXPERIENCE WITH IMPLEMENTATION OF THE ESMF

A. Environmental Category

Based on the activities, RERED AF 2 was classified as a Category 'B' which is appropriate and consistent with the provisions of OP/BP 4.01, and as the project objectives, designs and expected impacts remain unchanged, the safeguard category B will also remain unchanged for the proposed additional financing. As the project does not include any land acquisition, OP/BP 4.12 is not likely to be triggered in this project. As tribal people may live in many off-grid areas where different components of the project will be implemented, since transactions will be of commercial nature with willing buyer-willing seller basis, the Tribal Peoples Policy (OP/BP 4.10) was not triggered in the original RERED AF 2. The relevant national policies of Bangladesh like, the Environmental Conservation Act 1995 (ECA'95) and the Environmental Conservation Rules 1997 (ECR'97), Renewable Energy Policy of Bangladesh (2008), Bangladesh Labor Law (2006), etc. will be obliged for the project.

B. Methodology of Safeguards Compliance Followed In RERED AF 2 Project

To ensure the compliance of required environmental and social safeguards in a satisfactory manner, a comprehensive environmental and social management framework (ESMF) was adopted in June 2012. The ESMF, along with the Bangla version, was disclosed in websites of the implementing agencies (http: //www.idcol.org. and http://www.reb.gov.bd) in July 2012 and in the World Bank's InfoShop on the same date. Hard copies of the document were made available in IDCOL, REB, Power Cell and at the offices of the partner organizations of IDCOL. The Frameworks separately assessed the environment and social impacts of project components and serve as a set of guidelines to be used for projects where the precise nature and scale of sub-projects are not known in advance. These guidelines serve as a tool to select the optimal project intervention from social and environmental perspectives, to prepare preliminary designs, and to ensure complete integration of social and environmental concerns and mitigation measures in the design for the activities to be undertaken by project implementing agencies.

In general, the ESMF provides a set of policies, acts, rules, procedures, programs, and institutions that collectively work towards protecting and enhancing the attributes of the environment and persons that may be impacted by the activities undertaken in the Project. Various mitigation measures are outlined to minimize environmental impacts and fair compensation mechanisms should residual impact be unavoidable. Moreover, the ESMF provides screening, monitoring, and post-evaluation mechanisms so that any present or future impact can be identified and resolved quickly.

C. Summary Of Environmental Assessment of RERED II

The following are the major progress achieved under the ongoing RERED II project:

- There are 14 en-listed battery suppliers in IDCOL SHS program, who have fully completed the ISO 14001:2004 (Environmental Management Standard) and OHSAS 18001:2007 (Occupational Health Safety Standard) certification process. Out of these 14 battery suppliers, only 4 have their own recycling plants while the rest have entered into arrangements with the existing 4 recycling plants to use their facilities. Given the growth of the program, the existing recycling capacity will become inadequate in the near future; all the existing manufacturers need to have their own recycling plants.
- Safe disposal of expired batteries (5-year warranty period) has been ensured through enhanced incentives for returning the expired batteries to the approved recycling centers. The program has made it a requirement that all the battery manufacturers and the recycling centers in the country are to be compliant with ISO and OHSAS requirements to ensure safe recycling of batteries. As long as the batteries are returning to approved

recycling centers (and not to backyard smelters), the batteries are recycled in an environmentally safe manner because of the ISO and OHSAS requirements. A disposal mechanism is currently being worked out for the PV panels, which have 20-year warranty.

- Despite dropping the efficient lighting component from the project, the work on preparation national guideline for safe disposal and collection of CFLs throughout the country has commenced with the consultant appointed and the inception report has been submitted.
- The site specific environment and social screening/assessment along with the environmental and Social management plan (ESMP) has been carried out for all approved irrigation pump
- Audit Consultants was hired for undertaking an environment audit to assess the adequacy of the current mechanism for ensuring proper recycling of batteries.
- A consultant to be procured for preparing the guideline for safe disposal and recycling of PV panels.

D. Status of Battery Sector Before ESMF

Battery recyclers were found to recycle in neither environmentally compliant nor caring health safety aspects. Because there was lack of awareness on the importance of environment and health safety (EHS) aspects. There was no application of PPE, measures of controlling dust particle and thermal dispersion. Even there was no first aid box or minimum level of housekeeping. The collected expired batteries were broken manually. The residual electrolyte was discharged into the ground without adequate neutralization. Thereafter, the casing, separator and lead bars were separated without any use of PPE. They used to break casing manually by using hammer without adopting any health safety arrangement. The collected lead bar were melt into the rotary furnace and taken to kettle. The quality and efficiency of furnace and cattle were found inadequately efficient. The heat of rotary furnace was found to increase the temperature of ambient air resulting significant uncomfortable situation to workers.

E. Status of Compliance after ESMF

After incorporating the ISO 14001: 2004 and OHSAS 18001:2007 and ensuring regular monitoring, the environment and health safety condition of battery recycling plants have improved significantly and the recyclers follow a well-structured recycling. Due to the requirement ESMF, they have to either install new equipment and machineries or retrofit the existing set-up, which is also a significant positive outcome of ESMF. The battery plants are arranging training on basic EHS aspects for selected workers and officials and ensureing regular medical checkup facility for workers.

The expired batteries are broken with properly and the remaining electrolyte is poured in a tank containing water to neutralize the acid. The neutralize acid is let out through a drain/pipe to the nearby tertiary collector after proper treatment and being confirmed that the pH level has been adequately neutralized. The casing with lead bar and separator is taken to a special type of table, where lead bar are separated. Thereafter the casing is crushed for plastic chips as are required for manufacturing a new battery casing and the lead bar is taken to the well engineering melting section.

F. Environment Management of Various Activities of the Project

The potential environmental impacts of the project components under RERED II project and their corresponding mitigation measures as have been adopted by IDCOL are mentioned as follows:

Environmental impacts and corresponding mitigation measures adopted by IDCOL

Component	Impact	Mitigation measure

Component	Impact	Mitigation measure
SHS	**Operation Phase:** Improper management of expired batteries may lead to environmental pollution and health safety concern.	▪ IDOCL has prepared "Policy Guidelines on Disposal of Warranty Expired Battery". The customers, POs, and manufactures should comply with this Policy fully. ▪ IDCOL has introduced the tracking mechanism of proper disposal expired battery. ▪ IDCOL has deployed 12 solar inspectors spreading over in 12regional offices with coverage of the entire country to exclusively monitor the management of expired battery. ▪ There is a financial incentive for POs and recyclers for recycling the expired battery properly.
	Construction Phase: During manufacturing of lead-acid battery, there is significant risk of environmental and health safety hazards.	▪ IDOCL has required all battery suppliers and expired battery recyclers under SHS program to be ISO 14001:2004 and OHSAS 18001:2007 compliant in addition of the requirements of the DOE. At present, there are 17 battery suppliers and 3 expired battery recyclers, who have complied with these requirements. ▪ IDCOL arranges quarterly EHS compliance meeting to raise awareness about EHS and assess the implementation of required EHs standards. ▪ Installation of effluent treatment plant (ETP) and air treatment plant (ATP) have been made mandatory for en-listed battery suppliers and expired battery recyclers.
Solar irrigation	**Construction Phase:** Adverse Impact on ecosystem will not occur in general circumstances. However, moderate change in land use including tree clearing may be required depending on project site.	▪ To mitigate the scope of environmental impacts due to solar irrigation, IDCOL has introduced a special screening template, which covers most of the relevant aspects.
	Operation Phase: Excessive water use may cause impact on hydrology.	▪ IDCOL has emphasized the project proponent to prepare a proper water pump-up and use plan reference from experience in the surrounding areas and results of hydrological surveys. ▪ In addition, IDCOL has conducted a survey by an Expert about the water availability in various potential areas.
Mini-grid	**Construction Phase:** As mini-grid requires a considerable piece of land, there is scope of disturbance to site specific ecosystem in the Project area.	▪ To address the possible adverse impacts, IDCOL has made mandatory to project sponsor to prepare a detail environmental impact assessment (EIA). In this regard, IDCOL has introduced a well-structured ToR for EIA.
	Operation Phase: Due to operation of back-up generator, there could be temporal noise concern.	
	Operation Phase: Due to operation of diesel fueled back-up generator, there could be temporal concern due to SOx emission.	

Component	Impact	Mitigation measure
Gasification of Biomass	**Operation Phase:** Smoke from biomass gasification plant may cause air pollution. The smoke and dust may include hazardous substances and cause health disturbance to the workers.	▪ IDCOL has required a detail environmental impact assessment and the proper implementation of EMP.
	Construction Phase: Impact on ecosystem will not occur in ordinary circumstances. However, tree clearing may be required depending on project site.	
Biogas Power Generation	**Operation Phase:** Because waste water will be digested in the system, the environmental load will be reduced. However, improper slurry management may cause water pollution.	▪ IDCOL has required the project proponent to install sufficient facilities and conduct the proper maintenance.

G. **Social Management**

Among the project components, there is no specific land requirement for SHS because they can be installed at roof or any high place in the premise of customer. In addition, the requirement of land for ICS manufacturing plant will be localized which will be met by direct purchase of land from willing sellers. Similarly, land required for mini-grid, solar irrigation, biogas and biomass based project will be bought from the market. Thus, OP 4.12 will not be triggered in the additional financing phase. However, as the project will cover whole Bangladesh, tribal population may come in contact with the project. However, because the transactions with the IPs will be commercial in nature with willing-buyer willing-seller basis, OP4.10 was not triggered in the parent project. Consultations with the IPs are done in their local languages to be able to persuade them to buy the products/services that the project is supporting. IDCOL has adopted the following basic principles in regard of social safeguards as is provided below.

- A project requiring any type of land acquisition will not be financed
- No public lands will be used for the project
- Land whether made available via direct purchase or leasing will be screened to ensure that no physical displacement of communities/persons will take place

As a part of Social Management Plan, IDCOL has introduced a social compliance screening checklist as is provided below to adopt the mitigation measures in respect to the impacts.

Social safeguards compliance screening checklist

A. Involuntary Resettlement (IR) Aspect

- Does the project require any land acquisition?
- Type of land (public, private or lease)
- Is there any settlement present in the site?
- Is there any recorded litigation issue associate with the site?
- Is there any close relationship between the general livelihood pattern and the site in the project area
- Does the project require physical displacement of any person/household/community?

B. Indigenous People (IP) Aspect

- Is the project site located in indigenous people (IP) prone area?
- Is there any impact of the project on religious and cultural practice and belief of IP?
- Is there any impact of the project on livelihood pattern of IP?
- Is there any IP settlement recorded (present and near past) in the site?
- Is there any necessity of displacing (physically or economically) any IP person/household/community?
- What local language is used by the IP population?
- Is there any close relationship between the general livelihood pattern and the site in the project area
- Are the PO staffs conversant in these languages and is the information material relevant to the terms and conditions of purchasing the services and operation and maintenance of equipment available in local language?

H. Consultation and Participation

For SHS, the representatives of POs consult with potential customers and based on their response, they install SHS. The clients usually pay in installments by availing a micro credit from the POs. The same approach of consultation is applicable for ICS and biogas plant. Mini-grid, solar irrigation, biogas and biomass based power project require significant consultation as these projects will serve a wider community instead of individual households. Before financing these components, IDCOL assesses the local demand or customer's response on the components through exhaustive public consultation

I. Learning From The Assessment & Recommendation For AF For Further Improvement

Based on the aforesaid discussion, it can be concluded that the ESMF of REREDP II has adequately covered most of the environmental and social issues and IDCOL has shown competency to implement required measures. However, as enhancement is a continuous process, IDCOL plans to take the following measures.

Recommended measures for RERED II AF

Issue	Potential responsive measure	Proposed action in the ESMF of REREDP 2 AF
Pollution during PV panel manufacturing	▪ Ensuring proper EMS and OHS measures during manufacturing process	▪ ISO 14001:2004 and OHSAS 18001:2007 have been required for all PV panel suppliers.
Pollution with expired PV panel	▪ An Action Plan is required for proper disposal of PV panel	▪ An Action Plan to be formulated.
Proper management of expired battery	▪ Enforcing independent recycling facility for all battery suppliers	▪ It is planned to suggest a time line of installing recycling plant by all battery suppliers.
Satisfactory compliance of basic environmental, social and health safety aspects in regard of all project components	▪ All commercial biogas projects need to conduct detail environmental impact assessment (EIA). ▪ The respective official of IDCOL will regularly monitor the safeguards compliance of operational project ▪ The respective official of IDCOL will conduct site suitability assessment during the appraisal process.	▪ Commercial biogas and biomass based projects will conduct EIA. ▪ Environmental Specialist of IDCOL will initially assess and later on monitor the safeguards compliance status according to the schedule as has been provided as Annex-01.
Gender mainstreaming	▪ Adoption of Gender Action Framework	▪ Emphasis on Gender Development has been mainstreamed in the project.

Monitoring and reporting schedule

Sl. no	Project component	Monitoring and Reporting Issue	Frequency of Monitoring	Reporting Schedule	Disclosure
01	**Solar Home system**	Environmental and health safety (EHS) compliances of all IDCOL en-listed battery recycling plants with their effectiveness of ESMF implementation.	**Half-yearly**	**Half-**yearly Report	IDCOL website
		EHS compliances of all IDCOL en-listed battery suppliers with their effectiveness of ESMF implementation.	**Monthly** (manufacturing plant of two suppliers in each month)	**Quarterly** Report by comprising the observation of monthly monitoring	IDCOL website
		Basic EHS compliance of POs with emphasis on taking care of environmental and safety compliance during storage, collection and distribution of lead acid battery, PV panel and other accessories.	**Quarterly** (at the least two branch offices of three separate POs)	**Quarterly** (at the least two branch offices of three separate POs)	IDCOL website
		Expired battery collection and distribution of new battery	**Quarterly** (collect monthly report from POs and battery recyclers and compile it quarterly)	**Quarterly**	IDCOL website
		Quarterly EHS Compliance meeting at IDCOL for raising awareness of battery recyclers and manufacturers and assess their status of EHS implementation based on the submitted quarterly report	**Quarterly** (all battery recyclers and suppliers will attend the quarterly meeting, submit Compliance Report and share findings, IDCOL will arrange awareness raising presentation and so on.)	**Quarterly** (Outcome of the quarterly meeting based on the observation of the quarterly report submitted by the manufacturers and recyclers)	IDCOL website
02	**Solar irrigation**	Basic environmental, social and health safety compliance assessment of solar irrigation project under construction/operation.	**Half-yearly** (at least three operational projects in each six months)	**Half-yearly** (based on the observation of monitoring)	IDCOL website
		Assessment of suitability of project site in respect of basic environmental and social aspects for each new solar irrigation project as is to be installed.	**Once** for each project during appraisal process	**Once** during appraisal process	e-mail to respective stakeholders
03	**Mini-Grid**	Basic environmental, social and health safety compliance assessment including implementation of EMP of solar mini-grid project under construction/operation	**Half-yearly** (at least two operational projects in each six months)	**Half-yearly** (based on the observation of monitoring)	IDCOL website
		Assessment of the suitability of project site in respect of basic environmental and social aspects for each new mini-grid project.	**Once** for each project during appraisal process	**Once** during appraisal process	e-mail to respective stakeholders
04	**ICS**	Basic environmental and health compliance of manufacturing, operation and maintenance of ICS.	**Half-yearly** (at the least three ICS manufacturing plant of three POs)	**Half-yearly**	IDCOL website

Sl. no	Project component	Monitoring and Reporting Issue	Frequency of Monitoring	Reporting Schedule	Disclosure
05	**Biogas project**	Basic environmental, social and health safety compliance assessment including implementation of EMP of commercial bio gas based project under construction/operation	**Half-yearly** (at least two operational projects in each six months)	**Half-yearly**	IDCOL website
		Assessment of the suitability of project site in respect of basic environmental and social aspects for each new commercial biogas project.	**Once** for each project during appraisal process	**Once** during appraisal process	e-mail to respective stakeholders
06	**Biogas and biomass based power project**	Basic environmental, social and health safety compliance assessment including implementation of EMP of commercial bio gas/biomass based project under operation	**Half-yearly** (at least two operational projects in each six months)	**Half-yearly**	IDCOL website
		Assessment of the suitability of project site in respect of basic environmental and social aspects for each new commercial biogas project.	**Once** for each project during appraisal process	**Once** during appraisal process	e-mail to respective stakeholders
07		Describe the status of ESMF implementation over the annual scenario	**Annual Report**	**Annually**	IDCOL website