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GOVERNMENT OF THE REPUBLIC OF ZAMBIA

MINISTRY OF ENERGY
DEPARTMENT OF ENERGY

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

Zambia Electricity Service Access Project

Project ID: No. P162760

April 2017

EXECUTIVE SUMMARY

Project Description

The Government of Republic of Zambia (GRZ) has requested World Bank financing for the Electricity Supply Access Project (ESAP). The objectives of the project is to increase electricity access in targeted rural areas and support the enabling environment for accelerated electricity access in Zambia and the project will comprise three components namely; on-grid electricity access expansion, off-grid electricity access expansion and technical assistance. The Project is consistent with the long-term development objectives of the Government of the Republic of Zambia (GRZ), as articulated in the Vision 2030 and the recently approved Seventh National Development Plan (7th NDP). Project implementation will be similar to the recently closed Increased Access to Electricity Services Project (IAES). The overall project coordination will be undertaken by the Ministry of Energy (MoE) through a Project Steering Committee with the Rural Electrification Authority (REA) and Zambia Electricity Supply Corporation (ZESCO) as the implementing agencies. It is envisaged that REA will be serving as a fund manager for all the project funds while ZESCO will be implementing activities under the Component A for on-grid electricity access expansion. Implementation for the Component B, off-grid electricity access expansion are to be undertaken by REA, through a grant facility, and the Development Bank of Zambia (DBZ) through a loan facility.

Rationale for ESMF

The proposed project activities are expected to have low to moderate environmental and social impacts, which can be readily mitigated through an environment and social impacts assessment process. On the ESAP project, the Policy on Environmental Assessment has been triggered as component A and B of the project will involve infrastructure and construction related activities for both on-grid and off-grid power connectivity. Component C of the project will be technical assistance and capacity building. The project will broadly involve grid extension and intensification, subsidized connections to low-income rural customers under a similar results-based approach as used under the IAES and GPOBA funded projects. The project will further support a grant and a loan facility to support electrification of rural communities through private sector lead mini-grid developments and commercial sale of stand-alone systems.

Project Description

The ESAP is aimed at increasing electricity access in targeted rural areas across Zambia and will comprise three components that will involve:

Component A: On-grid Electricity Access Expansion Component

This component will provide financing for on-grid connections in rural areas utilizing the approaches under the OBA/Connection Fee Subsidy Program.[1] To support the last mile connections, the Project will also finance critical distribution network reinforcements and

[1] The World Bank has been supporting improved electricity access in low-income areas using results-based approaches through the Increased Access to Electricity Services Project and the grant from the Global Partnership on OBA (GPOBA). The GPOBA grant to ZESCO is financed with funding from the Government of Sweden through Swedish International Development Cooperation Agency (SIDA). The projects have enabled ZESCO to connect over 120,000 households over the last eight years.

extensions that will enable ZESCO to add new connections to the grid, complementing ongoing access expansion efforts by development partners in other parts of the country.

Component B: Off-grid Electricity Access Expansion Component

The least cost option to provide electricity access for over 60 percent of the rural population is through off-grid solutions, mainly through mini-grid and stand-alone systems based on solar PV. Government has decided to pilot approaches for attracting private sector investment and participation into the off-grid energy sector, as there is neither any plans nor public funding available for electrification of households in these areas. The binding constrains for private sector participation in the sector have been the difficulties in accessing financing and a cumbersome and unclear regulatory regime. This component will therefor fund upstream activities to enhance the enabling environment and the piloting of two financial mechanisms: (i) a Smart Grant Subsidy Facility; and (ii) a Loan Facility, to support private sector lead electrification of rural communities through RE mini-grids and stand-alone solar systems. Both these mechanisms will be structured to leverage financing and participation from the private sector. The design of the financial mechanisms and upstream activities, which is in line with the recommendations of the World Bank's Africa Off-Grid Solar Strategic Directions based on regional experience in supporting the off-grid solar sector, will be refined based on the experience in these pilots and scaled up in future access programs.

Component C - Capacity Building and Project Implementation Support.

This component will finance Technical Assistance (TA) to GRZ to (i) ensure the Project reaches its objective of enhancing and improving the enabling environment needed for a substantially scaled up electrification effort and (ii) to support effective project implementation. TA will include (i) development of NES and the geospatial planning tool; (ii) outreach and consumer education activities aimed at informing and assisting consumers (focusing on women and vulnerable groups) in the connection fee subsidy application process, informing of the benefits of solar lighting products, educating on the characteristics of good quality products; (iii) services of the Project Management Consultant (PMC) and IVA; and (iv) capacity building to key government institutions (DoE, ZESCO, REA), solar companies, and participating financing intermediaries to assist them to fulfil efficiently their functions under the Project

Since specific sites and beneficiary communities have not been defined, The Ministry of Energy (MoE), Rural Electrification Authority (REA) and Zambia Electricity Supply Corporation (ZESCO) have developed an Environmental and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF) that addresses the environmental and social risks associated with the implementation of the Electricity Service Access Project. Once the specific sites and the beneficiary communities have been defined, all projects subprojects and activities will be screened the appropriate Environmental and Social Impact Assessments (ESIAs), Environmental and Social Management Plans (EMSPs) and Resettlement Action Plans (RAPs) will be developed where applicable, in line with the provisions of the ZEMA EIA regulations and Bank safeguards policies. The ESMF provides project description, environment and social baseline, identification of anticipated risks and impacts, management and monitoring plan and institutional arrangements.

The implementation of the ESAP project and associated subproject during preparation, construction and operational activities are likely to result in the following environmental and social risks/impacts namely; Increased access to electricity that will promote a better quality

of life and increased productivity, job creation and business opportunities, loss of vegetation, generation of construction waste, alteration of flowrates, ecological and environmental flows on rivers that will house mini hydros, increase in soil contamination and dust levels, increased safety and security risks for workers and the community including incidences of electrocution, visual intrusion and alteration in aesthetics and increased incidences of HIV/AIDS and Sexually Transmitted Infections (STIs). Since most of the specific project activities and locations have not yet been agreed on, the proposed environmental assessment instrument is an Environmental Social Management Framework (ESMF). The ESMF also includes provisions related to compliance with the World Bank safeguard policies and national ZEMA Regulations.

The ESMF has been prepared and will be disclosed prior to appraisal, it further provides detailed step-by-step processes for identification and screening of the sub-projects of critical environment and social risks; procedures for evaluation of significance of environmental risks and impacts; development of site specific mitigation and monitoring plan when subproject details are identified; and institutional arrangement for safeguards implementation and capacity building measures. The ESMF provides guidance for development of any associated Environmental and Social Management Plans (ESMP) that will present mitigation measures to address the potential environmental and social impacts of the Project at the subproject level, once the activities location and scope have been identified. The ESMPs will be prepared, consulted with local communities and disclosed prior to commencement of detailed planning and physical works, consistent with the World Bank policy on Environmental Assessment (OP4.01). Management and supervision requirements for the physical, chemical and biological environment (waste, water and sanitation etc.), health and safety of construction workers and safety and security of neighboring communities are built into the ESMF.

Implementation and Monitoring System

The Project will use similar implementation arrangements to those of the previous IAES project with ZESCO and the REA as the implementing agencies, and the MoE being responsible for overall coordination that would be carried out through a Project Steering Committee. It is anticipated that REA will be serving as a Fund Manager for all the project funds. ZESCO will be implementing activities under the Component A On-grid Electricity Access Expansion. Implementation arrangements for the Component B Off-grid Electricity Access Expansion are to be finalized depending on the design options being currently discussed. The implementation arrangements and fund flows will be finalized during appraisal. Implementation of Component C Technical Assistance will be carried out by REA, and ZESCO, depending on the activity. The two institutions will assign dedicated project coordinators and teams to manage implementation of this project. A project steering committee will be set up, comprising MoE, REA, ZESCO, and any other relevant institutions to provide policy guidance and overall coordination.

The PIUs will be responsible for undertaking compliance monitoring and impacts mitigation measures. The PIUs must ensure that the project implementers submit reports on work progress and any challenges in observing the Environmental and Social Safeguards. The monitoring results should form a major part of the reports to be submitted to MoE, the World Bank and shared with ZEMA where applicable.

ESMF outline

The first three Chapters (Chapters 1 to 3) of the ESMF provide background information that starts with a description of the proposed project which is followed by a brief explanation of

the methodology used in formulating the ESMF as well as baseline information. Chapter 4 provides an overview of the World Bank Operational Policies and national environmental management policies and regulations. The last four chapters of the ESMF provide guidelines on potential environmental and social impacts that are anticipated for various proto-type sub-projects, respective possible mitigation measures as well as relevant institutional arrangements for implementation and monitoring of safeguards. Chapter 8 of the ESMF takes into account prevailing institutional capacities and needs and recognizes the need for capacity building in safeguards application and monitoring.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

7thNDP	Seventh National Development Plan
AER	Agro-Ecological Regions
AIDS	Acquired Immune Deficiency Syndrome
CSO	Central Statistical Office
DBZ	Development Bank of Zambia
DMMU	Disaster Management and Mitigation Unit
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
ESIA	Environmental Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental Social Management Plan
FMO	Financial Management Officer
GBV	Gender Based Violence
GDP	Gross Domestic Product
GMAs	Game Management Areas
GPOBA	Global Partnership on Output Based Aid
GRZ	Government of the Republic of Zambia
HIV	Human Immunodeficiency Virus
IAES	Increased Access to Electricity Project
IDA	International Development Association
ITCZ	Intertropical Convergence Zone
M&E	Monitoring and Evaluation
MOE	Ministry of Energy
MSME	Micro – Small and Medium Enterprises
MTEF	Medium Term Expenditure Framework
NES	National Electrification Strategy
NGOs	Non-Governmental Organizations
NHCC	National Conservation Commission
OP/BP	Operational Bank Policy
PfR	Program for Results
PIUs	Project Implementing Units
PMC	Project Management Consultants
PPE	Personal Protective Equipment
PSC	Project Steering Committee
PV	Photo Voltaic
RAP	Resettlement Action Plan
REA	Rural Electrification Authority
REMP	Rural Electrification Master Plan
RPF	Resettlement Policy Framework
SME	Small and Medium Enterprises
STIs	Sexually Transmitted Infections
TA	Technical Assistance
ZDA	Zambia Development Agency
ZEMA	Zambia Environmental Management Agency
ESAP	Zambia Electricity Supply Access Project
ZESCO	Zambia Electricity Supply Corporation
ZPPA	Zambia Public Procurement Authority

CHAPTER 1: INTRODUCTION

1.1 Project Background

The Government of Republic of Zambia (GRZ) has requested for World Bank financing for the Electricity Supply Access Project (ESAP). The objective of the project is to increase electricity access in targeted rural areas of Zambia. The project will comprise three components namely; on-grid electricity access expansion, off-grid electricity access expansion and technical assistance. The Project is consistent with the long-term development objectives of the GRZ, as articulated in the Vision 2030 and the recently approved Seventh National Development Plan (7thNDP). Project implementation will be similar to the recently closed Increased Access to Electricity Services Project (IAES). The overall project coordination will be undertaken by the Ministry of Energy (MoE) through a Project Steering Committee with the Rural Electrification Authority (REA) and Zambia Electricity Supply Corporation (ZESCO) as the implementing agencies. It is envisaged that REA will be serving as a Fund Manager for all the project funds while ZESCO will be implementing activities under the Component A for on-grid electricity access expansion. Implementation for the Component B, off-grid electricity access expansion are to be undertaken by REA, through a grant facility, and the Development Bank of Zambia (DBZ), through a loan facility.

The current state of electrification and the recently achieved progress in Zambia suggest that addressing electrification will require a much more comprehensive approach addressing both rural and urban areas and utilizing both the on-grid and off-grid technologies. Furthermore, given the limited fiscal space of the public finances, there is a need for crowding in the private sector. It will require significant efforts from the GRZ in creating a proper enabling environment, including building up the existing capacity of the sector institutions, maturing the financial sector, and supporting the nascent private sector. There is a need for applying sector wide approaches utilizing the country-based system and the Bank could utilize its appropriate instruments, such as Program-for-Results (PfR). However, the current state of the country and sector systems will require more efforts to build up the capacity to an appropriate level. Therefore, the project would aim to fill the capacity gaps to be identified during the project preparation and implementation and serve as a bridge towards more complex approaches.

The project will scale up access to electricity in rural areas through a well-established effort under the Connection Fee Subsidy Program of the on-going Global Partnership on Output-Based Aid (GPOBA) project and the now closed International Development Association (IDA) financed IAES[2]. In addition, the project will include critical network reinforcements as the distribution network is near its capacity and hence further investment is needed to enable ZESCO to add new connections to the grid. The investments in network reinforcements will

[2] The World Bank has been supporting improved electricity access in low-income areas using results-based approaches through the now closed IDA-financed Increased Access to Electricity Services Project (IAES-P077452) and the output-based aid (OBA) grant for the Electricity Access for Low Income Households in Zambia Project (P146636). The OBA grant to ZESCO is financed by the Global Partnership on Output Based Aid (GPOBA) with funding from the Government of Sweden (Sida). The projects have enabled ZESCO to connect over 120,000 households over the last eight years. The closed IAES project achieved a disbursement rate of 97%, and the on-going GPOBA-funded project has a disbursement rate of 82% (closing date June 30, 2017).

be financed using a results-based financing approach similar to the one used in IAES, which will enable faster implementation and disbursement. The project will also include a pilot program in support of private sector-lead off-grid electrification effort and other preparatory, analytical and capacity building work. It may include developing a geospatial-based electrification planning framework/platform, preparing a National Electrification Implementation Roadmap, a nation-wide geospatial least cost-investment plan, and access investment prospectus. Primary beneficiaries of the project shall be low-income households and Micro and Small Enterprises (MSEs) in rural areas outside of the Lusaka area. The project shall enable them to access affordable electricity and modern energy services, which otherwise would not be possible.

The Policy on Environmental Assessment has been triggered as component A and B of the project will involve infrastructure and construction related activities for both on-grid and off-grid power connectivity. The project will broadly involve, grid extension and intensification, subsidized connections to low-income rural customers under a similar results-based approach as used under the IAES and GPOBA funded projects. The project will further support a grant and a loan facility to support electrification of rural communities through private sector lead mini-grid developments and commercial sale of stand-alone systems. Since specific sites and beneficiary communities have not been defined, The MoE, REA and ZESCO have developed an ESMF and RPF that addresses the environmental and social risks associated with the implementation of the electricity service access project. Once the specific sites and the beneficiary communities have been defined, all projects subprojects and activities will be screened and the appropriate ESIAs, EMSPs and RAP will be developed were applicable in line with the provisions of the ZEMA EIA regulations and Bank safeguards policies. In addition, the World Bank Group Environmental, Health and Safety Guidelines are applicable to the project, with the following specific guidelines to be adopted and utilized by the contractors and other project implementers: general, occupational health and safety, community health and safety, waste management facilities.[3]

1.2 ESMF Objectives

The objectives of this ESMF are;

- To establish clear procedures and methodologies for the environmental and social planning, review, approval and implementation of subprojects to be financed under the ESAP;
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to subprojects;
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF;
- To establish the project funding required to implement the ESMF requirements;
- To provide practical resources for implementing the ESMF, including general guidance on development of ESMPs and their implementation.

[3] World Bank Group EHS Guidelines:
http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/our+approach/risk+management/ehsguidelines

1.2.1 Objectives of the Resettlement Policy Framework

A Resettlement Policy Framework (RPF) has been developed as a separate document to address matters that relate to involuntary resettlement. The overall objective of this RPF is to provide guidance on how to deal with issues relating to land acquisition, compensation and resettlement during the implementation of the ESAP.

The specific objectives of the RPF are as follows:

- to minimize, as much as possible, acquisition of land for implementation of project sub-components, where such acquisition or project related activities will result in adverse social impacts;
- to ensure that where land acquisition is necessary, this is executed as sustainable programs to enable people share in the project benefits,
- to ensure meaningful consultation with people to be affected or displaced; and
- to provide assistance that will mitigate or restore the negative impacts of ESAP implementation on the livelihoods of people affected in order to improve their livelihoods or at least restore to pre-project levels.

1.3 Project Description

The ESAP is aimed at increasing electricity access in targeted rural areas across Zambia and will comprise three components that will involve;

1.3.1 Component A: On-grid Electricity Access Expansion Component

This component will provide financing for on-grid connections in rural areas utilizing the approaches under the OBA/Connection Fee Subsidy Program.[4] To support the last mile connections, the Project will also finance critical distribution network reinforcements and extensions that will enable ZESCO to add new connections to the grid, complementing ongoing access expansion efforts by development partners in other parts of the country. The component will be implemented through two sub-components:

Sub-Component A.1. – Expanding New Electricity Connections for Low-income Households through OBA-type financing.

This sub-component will support "last mile" connections to about 20,000 low-income households[5] and 1,000 MSEs (about 105,000 beneficiaries) in rural areas outside the eighteen designated city and municipal councils[6]. It will use OBA approach with results based financing

[4] The World Bank has been supporting improved electricity access in low-income areas using results-based approaches through the Increased Access to Electricity Services Project and the grant from the Global Partnership on OBA (GPOBA). The GPOBA grant to ZESCO is financed with funding from the Government of Sweden through Swedish International Development Cooperation Agency (SIDA). The projects have enabled ZESCO to connect over 120,000 households over the last eight years.

[5] As rural areas in Zambia are by and large poor, the Project makes the implicit assumption that households reached are low income; however, this assumption will be aligned with and confirmed by poverty mapping work.

[6] Areas excluded under the project are: the city councils of Lusaka Urban, Ndola Urban, Kitwe and Livingstone, and the municipal councils of Chingola, Mufulira Mufulira, Luanshya, Kalulushi, Kabwe,

partially subsidizing the cost of new connections for low-income households and MSEs. Payments will be linked to attainment of results based on pre-agreed targets, which will be verified by an Independent Verification Agent (IVA). The progress of this sub-component will be subject to the grid being able to handle new connections further to the investments being made under sub-component A.2. Areas that do not require network reinforcements or medium voltage grid extension will be prioritized for connections during project implementation. The sub-component will finance two types of connections based on the type of housing structure:

a. ***Standard Connection*** for permanent structures will include the drop-wire from a supply line (up to 30 meters) to the meter box, a single-phase pre-payment meter and three energy saving Light-Emitting Diode (LED) bulbs.
b. ***Enhanced Connection*** primarily for structures with thatched roofs, which cannot be safely wired, will include the drop-wire from a supply line (up to 30 meters) to the meter box, a single-phase pre-payment meter, a ready board and one energy saving LED bulb.

In order to enable ZESCO to connect rural households and MSEs to the network, the Project will reimburse ZESCO for the cost of connections less the subsidized connection fee to be paid by consumers. It is expected that approximately 10% of households with thatched roofs will require ready boards. Given the generally low-income nature of the target consumers, it will not be possible to charge consumers extra for the ready boards. Hence, a flat contribution of K250 is proposed to be paid by household consumers for both standard and enhanced connections.

Sub-Component A.2. - Extension and Strengthening of the Grid Network to handle New Connections.

This sub-component will include construction of 33/11 kV distribution lines, installation of distribution transformers, and construction of medium/low voltage distribution lines (400/230V). REA and ZESCO will jointly agree on target areas where investments are to be made, including rural areas with higher population density and projects with positive economic rate of return. About 36 potential rural areas have been identified in a broad geographical scope covering most of the country's provinces (Northern, North Western, Luapula, Muchinga, Copperbelt (Ndola), Eastern, Western, Southern and Central). In several parts, REA has already extended the network to serve public facilities. Implementation will start with these areas, for which minimal extension works are required, and progressively move to those areas that will require more works. Detailed technical assessments, feasibility studies and scoping, as well as economic and financial analyses will be carried out as needed, especially for those areas requiring more investment in extension and grid strengthening. The electrification of rural areas currently supported by other development partners (e.g. Lusaka division supported by the European Union (EU)-funded project and parts of Southern division supported by the KfW-funded project) will be excluded from this Project. REA and ZESCO contribution of US$2.4 million has been assessed in terms of the staff time and internal resources needed to implement the project.

Chililabombwe, Kasama, Chipata, Mongu, Solwezi, Mansa, Choma, Mazabuka, and Mbala. Any sub-areas within these excluded councils that are determined as rural by REA and ZESCO may be eligible for funding subject to endorsement of the Steering Committee.

1.3.2 Component B: Off-grid Electricity Access Expansion Component

The least cost option to provide electricity access for over 60 percent of the rural population is through off-grid solutions, mainly through mini-grid and stand-alone systems based on solar PV[7]. Government has decided to pilot approaches for attracting private sector investment and participation into the off-grid energy sector, as there is neither any plans nor public funding available for electrification of households in these areas. The binding constrains for private sector participation in the sector have been the difficulties in accessing financing and a cumbersome and unclear regulatory regime[8]. This component will therefor fund upstream activities to enhance the enabling environment and the piloting of two financial mechanisms:[9] (i) a Smart Grant Subsidy Facility; and (ii) a Loan Facility, to support private sector lead electrification of rural communities through RE mini-grids and stand-alone solar systems. Both these mechanisms will be structured to leverage financing and participation from the private sector. The design of the financial mechanisms and upstream activities, which is in line with the recommendations of the World Bank's Africa Off-Grid Solar Strategic Directions based on regional experience in supporting the off-grid solar sector, will be refined based on the experience in these pilots and scaled up in future access programs.

Sub-component B.1. - Off-Grid Electrification Smart Subsidy Program

This sub-component will fund activities aimed at designing, establishing and piloting an Off-Grid Electrification Smart Subsidy Program (OGESSP). OGESSP will provide partial grant subsidies to support the development of private sector led mini-grids that may be complemented with stand-alone solar systems. Locations will be selected in accordance with the geo-spatial plans to be developed under the NES. This sub-component will be implemented in two phases. The first phase will include upstream work to create an enabling environment to support private sector lead off-grid electrification and to design the OGESSP in close consultation and collaboration with both public sector agencies and private sector developers.

The upstream work will include: (i) identifying potential sites through the use of the geospatial planning platform;[10] (ii) preparing market assessments[11] for the potential sites; (iii) reviewing the regulatory framework and supporting relevant institutions in streamlining requirements in support of private sector led off-grid electrification; (iv) design the OGESSP including types and levels of subsidy to be provided and developing operational procedures for the OGESSP; and (v) developing standard legal documents including drafts of tendering documents and PPP

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[7] REMP and *http://energydata.net*

[8] *Analysis of off-grid* solar in Zambia and suitable market-based options for scale-up, study ongoing 2017; Se4All EU: Policy Support to Improve the Enabling Environment of the Zambian Energy Sector, 2017; and Developing Mini-grids in Zambia: How to build sustainable and scalable business models?, Practical Action 2016

9 Several financing mechanism options were considered during the design stage including loan facility, equity fund, guarantee mechanism and different type of grants. The description and assessment of the financing mechanism option is in Annex 6.

[10] The geospatial-based electrification planning platform developed by IFC and the World Bank available through the World Bank's energydata.info project will be further refined, detailed and utilized

[11] Including demand estimates, willingness to pay / ability to pay assessments, customer segmentation, etc.

agreements. REA will undertake this upstream work[12] in close consultation and collaboration with both public sector agencies such as ERB and private sector developers.
Private developers were consulted during the project preparation representing both large international companies and smaller innovators that are active in the mini-grid sector in the region and currently exploring business expansion opportunities in Zambia. These confirmed the private sector interest. The initial stage of implementation of the SIDA-supported Power Africa: Beyond the Grid Fund for Zambia (BGFZ)[13] has further confirmed the private sector's interest in the off-grid energy electrification. The upstream phase will result in REA's adoption of the OGESSP operational procedures and standard legal documents, following Bank's appraisal and no-objection. The first phase will be completed by project midterm or earlier, when the second phase (operational phase) commences.

In the second phase, REA will pilot the OGESSP competitively selecting private operators to provide energy services to households, public facilities and MSEs in the selected rural localities. While OGESSP will not specify technology, it is expected that mini-grids will be primarily solar PV based, providing an agreed level of electricity service (expected to be Tier 3-4). [14] In some instances, market characteristics may require mini-grids complemented with stand-alone systems.[15] It is expected that the subsidy will cover the viability gap (the difference between cost of providing connection and what consumer are willing/able to pay for it). This will be further defined during the design of the OGESSP in phase one.

Sub-Component B.2. - Off-Grid Loan Facility
The sub-component will set up and pilot a loan/credit line facility for eligible borrowers, including companies importing and selling solar equipment, developers of mini grids and end-user of solar equipment such as agribusinesses. It will aim to address the existing constraint of lack of access to finance and, therefore, facilitate growth of the off-grid electrification market. Access to finance is a key barrier to growth of the solar energy market. The Development Bank of Zambia (DBZ)[16] will act as a financial intermediary for the credit line and would either lend directly to eligible borrowers or act as wholesale lender to one or more commercial banks who would then lend to eligible borrowers.

[12] With potential support from IFC, subject to mobilization of funding from other sources.
[13] BGFZ focuses on lower Tiers (Tier 1-2). OGESSP will complement BGFZ and initially focus on rural locations requiring higher tiers 3-4. Further, OGESSP focuses on developing local institutional arrangements and capacity to implement the program.

[14] Defined in SE4All Multi-tier- framework
[15] Private operator can serve households with SHS (expected to be Tier 2) where distances require lower service levels. This model, were mini-grid operators also serve some of their consumers with PayGo SHS is currently being tested by the two private mini-grid operators in Zambia (Muhanya Solar Ltd and Zengamina Power Trust) given that rural growth centers are surrounded by much lower density areas with scattered households.

[16] Annexes 1 and 5 reflect detailed rationale for the selection of DBZ as a financial intermediary and for preserving the wholesale and retail lending options for DBZ until the results of the IDP are known. DBZ has previously provided loans to two mini-grids under the UNDP/GEF-funded RE Based Isolated Mini-Grids in Zambia Project, which details are in Annex 6.

This sub-component will also be implemented in two phases. The first, upstream phase will include: (i) developing and implementing an Institutional Development Plan (IDP)[17] for DBZ to raise its capability and skillset in key areas, (ii) designing the Loan Facility structure and loan terms, (iii) developing the Project Operational Manual (POM), (iv) developing standards legal agreements and operating policies/ procedures for the Loan Facility, including criteria for selecting eligible borrowers, exposure limits, permitted loan products, currencies, tenors, amortization and interest rate terms, and standard loan covenants. Completion of this phase will be signaled by IDA's appraisal and no-objection on all necessary arrangements including Project Operational Manual (OP) (which includes safeguard principles and operationalization of the ESMF and RPF), standards legal agreement and meeting the World Bank Policy on Financial Intermediary Lending (OP 10.00) requirements. This is expected to be completed by project midterm or earlier, at which point the second phase (operational phase) will commence. As a potential Financial Intermediary for phase 2 off-grid activities, DBZ will also have safeguard oversight responsibilities, for which it will receive appropriate capacity building under the technical assistance activities planned for phase 1. However DBZ phase two participation can only be initiated after a proper safeguard assessment is carried out which ensures that the arrangement and capacity meet the World Bank's minimum requirements under OP/BP10.00.

The second phase will pilot the Loan Facility and operationalize the credit line. DBZ will offer short, medium and long-term loans in US$ and ZMW either directly to eligible borrowers or through participating financial intermediaries, depending on the role selected for DBZ in phase one above. Under the Project, there will be two main types of credit offered to eligible borrowers:

- Short and medium term loans in US$ and ZMW to provide working capital to eligible borrowers, including locally registered solar system importers, wholesalers, distributors and retailers with ongoing liquidity access to finance inventories.18
- Medium and long-term loans in ZMW to finance eligible borrowers including solar PayGo companies and mini-grid developers.

1.3.3 Component C - Capacity Building and Project Implementation Support.

This component will finance Technical Assistance (TA) to GRZ to (i) ensure the Project reaches its objective of enhancing and improving the enabling environment needed for a substantially scaled up electrification effort and (ii) to support effective project implementation. TA will include (i) development of NES19 and the geospatial planning tool;

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[17] The IDP will cover credit risk assessment, risk-based loan pricing, foreign exchange risk management and E&S due diligence and is described in Annex 5.

[18] All supported systems will be required to meet the Lighting Global Quality Standards.

[19] NES is expected to be based on geospatial-based electrification planning platform, building on the existing Off-grid Energy Market Opportunities tool (http://offgrid.energydata.info). NES would include an updated Master Plan and Investments Prospectus to support a systematically staged and coordinated electrification rollout program. Development of the NES would require a comprehensive assessment of the existing REF and preparation, discussion and adoption of recommendations aiming to increase sustainability of financial mechanism for rural electrification, including for on and off-grid subsidies. It will also require development of feasibility studies for grid extension and network reinforcement and recommendations for a Code of Practice for low cost electrification schemes.

(ii) outreach and consumer education activities aimed at informing and assisting consumers (focusing on women and vulnerable groups) in the connection fee subsidy application process, informing of the benefits of solar lighting products, educating on the characteristics of good quality products; (iii) services of the Project Management Consultant (PMC) and IVA; and (iv) capacity building to key government institutions (DoE, ZESCO, REA), solar companies, and participating financing intermediaries to assist them to fulfill efficiently their functions under the Project.

1.4 Safeguards Approach

The project includes a number of activities for which screening may be required leading to preparation of ESIAs, ESMPs and RAPs where applicable. For instance, infrastructure and construction related activities for both on-grid and off-grid power connectivity may generate environmental and social impacts. The project will broadly involve grid extension and intensification, subsidized connections to low-income rural customers under a similar results-based approach as used under the IAES and GPOBA funded.

The ESMF provides the procedures to address the environment and social risks. However, the details under this sub-component such as the site details, including designs are expected to be available during the course of project implementation. Table 1 highlights the anticipated subprojects, activities and investments envisaged under the project.

Table 1; Anticipated Sub Projects/Investments

Project Component	**Project Category**	**Anticipated Activities/Subprojects**
Infrastructure/Construction related	Component 1: On-grid Electricity Access	• Grid extension and intensification; • Connection fee subsidy to low-income rural customers under a similar results-based approach as used under the IAES and GPOBA funded projects; and •
	Component 2: Off-grid Electricity Access Expansion	• A subsidy scheme; and • A loan facility to support electrification of rural communities through private sector led mini-grid developments and commercial sale of stand-alone system.

1.5 Potential Risks and Impacts

The implementation of the ESAP project and associated subproject during preparation, construction and operational activities are likely to result in the following environmental and social risks/impacts namely; Increased access to electricity that will promote a better quality of life and increase productivity, job creation and business opportunities, loss of vegetation, generation of construction waste, increase in soil contamination and dust levels, increased safety and security risks for workers and the community including incidences of electrocution, visual intrusion and alteration in aesthetics and increased incidences of HIV/AIDS and Sexually Transmitted Infections (STIs). Since most of the specific project activities and locations have

not yet been agreed on, the proposed environmental and social assessment instrument is an Environmental Social Management Framework (ESMF). The ESMF also includes provisions related to compliance with the World Bank safeguard policies:

1.6 Bank Polices Triggered

On the ESAP, four (4) out of ten (10) operational bank polices have been triggered and these are environmental assessment, natural habitats, forests and involuntary resettlements. The reasons for triggering the polices have been provided below;

- ***OP/BP 4.01 - Environmental Assessment***
  The Policy on Environmental Assessment has been triggered as component A and B of the project will involve infrastructure and construction related activities for both on-grid and off-grid power connectivity. The project will broadly involve, grid extension and intensification, subsidized connections to low-income rural customers under a similar results-based approach as used under the IAES and GPOBA funded projects. The project will further support a loan facility to support electrification of rural communities through private sector lead mini-grid developments and commercial sale of stand-alone systems. Since specific sites and beneficiary communities have not been defined, The MoE, REA and ZESCO have developed an ESMF and RPF that addresses the environmental and social risks associated with the implementation of the electricity service access project. Once the specific sites and the beneficiary communities have been defined, all projects subprojects and activities will be screened and the appropriate EISA's, EMSP's and RAP will be developed were applicable in-line with the provisions of the ZEMA EIA regulations and Bank safeguards policies.

- ***OP 4.04 – Natural Habitats***
  The policy on natural habitats has been triggered as the project will involve linear activities such grid extension and intensification that are likely transverse ecologically sensitive areas and natural habitats.

- ***OP 4.36 – Forests***
  The policy has been triggered as linear activities such as grid extension and reinforcement, construction of off grid facilities and installation may require vegetation clearance. The extent of vegetation loss is however, minimal as construction activities will be restricted to the way leave and project footprint.

- ***OP/BP 4.12 – Involuntary Resettlement:***
  No physical displacement is anticipated due to the nature of the project. However, the project through Component A and B Network Reinforcement may require some land for the substation, powerline poles, and low voltage distribution line, or for installation of mini-grid solar arrays and may involve small land acquisition, and limited change in land use (permanent or temporary). OP/BP 4.12 is therefore triggered to address the impacts of the potential land acquisition and limited changes in land use, which may cause losses of assets. As the specific subprojects are not yet clearly defined and the exact sites of the proposed investments are not yet known, an RPF has been developed and submitted to the Bank for clearance by the MoE, REA and ZESCO to address issues relating to relocation, encroachments and compensation.

1.7 Implementation Arrangements

The Project would use similar implementation arrangements to those of the previous IAES project with ZESCO and the REA as the implementing agencies, and the MoE being responsible for overall coordination that would be carried out through a Project Steering Committee. It is anticipated that REA will be serving as a Fund Manager for all the project funds. ZESCO will be implementing activities under the Component A *On-grid Electricity Access Expansion.* Implementation arrangements for the Component B *Off-grid Electricity Access Expansion* are to be finalized depending on the design options being currently discussed, but will involve REA for the grant facility and DBZ for the loan facility. The implementation arrangements and fund flows will be finalized during appraisal. Implementation of Component C *Technical Assistance* will be carried out by both REA, ZESCO and DBZ, depending on the activity. The three institutions will assign dedicated project coordinators and teams to manage implementation of this project. A project steering committee will be set up, comprising MoE, REA, ZESCO, DBZ, and any other relevant institutions to provide policy guidance and overall coordination.

The Project will be implemented over 5 years. The overall policy guidance, oversight and coordination over the project implementation will carried out by the Project Steering Committee, chaired by the MoE and comprising REA, ZESCO, DBZ and other relevant ministries and government institutions like Ministries of Finance, National Planning, Local Government. Given overall rural electrification mandate assigned to the REA, it will be responsible for the overall project implementation on behalf of GRZ, serving as a focal point on the project implementation issues for GRZ and the World Bank and other co-financing donors, coordinating project daily implementation, channeling project funds, and consolidating project reporting. REA will engage with engage a consultancy firm in a role of a Project Management Consultant (PMC) to support REA in project management, including carrying out supervision of contracts due to capacity constraint. Over the longer run, this capacity is expected to gradually be transferred to REA. To strengthen the role of REA as a facilitator of rural electrification and build the appropriate in-house capacity, implementation modalities of activities of each of the project components will differ. The Project will support the shift of the REA's role form rural electrification projects developer to rural electrification facilitator, aiming to build up a set of tool to incentivize project developers (e.g. ZESCO and/or private developers) to implement specific rural electrification projects. To the extent feasible, the Project will utilize the proven implementation mechanisms from previous projects financed by GRZ and Cooperating Partners.

For implementation of the specific activities under the Component A, On-grid Electricity Access Expansion, REA will enter into an Execution Agreement with ZESCO, specifying commitments, roles and responsibilities of REA and ZESCO. Component sub-projects will be identified jointly by REA and ZESCO, with REA providing financing for ZESCO to implement the identified projects. ZESCO will report back to REA and the achieved results will be verified by REA through an independent Implementation Verification Agent (IVA), to be contracted by REA. REA's advance funding will be deposited to ZESCO's operating account and will be replenished monthly based on the Statements of Expenditures (SOEs) submitted by ZESCO and verified by IVA.

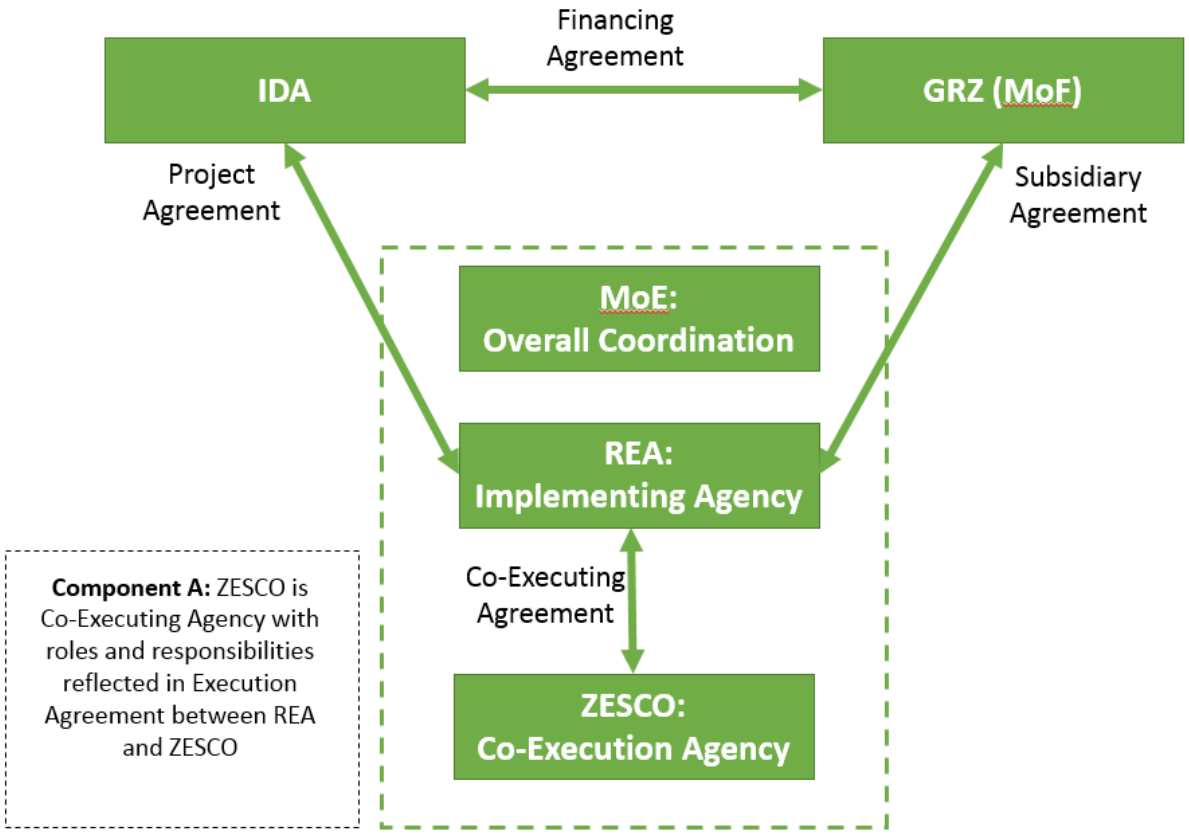

Figure 1: ESAP Project Implementation Structure - Component A - On Grid

The Component B Off-grid Electricity Access Expansion activities will focus on a development of scalable, economically and financially feasible off-grid alternatives, to: (i) increase electricity access in rural Zambia to productive enterprises, service delivery facilities, and to households with the capacity to pay for electricity; (ii) establish a functioning institutional and regulatory framework for commercially oriented, sustainable service delivery for rural electrification that can be scaled up; and (iii) exploit Zambia's renewable energy potential.

The Component B will include two areas of support: (Sub-Component B1) provision of performance grants to private developers to partially cover investment costs (through performance grants) and (Sub-Component B2) a credit line to complement and leverage private developers' investments. The off-grid electrification activities are expected to be carried out by private developers for the sub-projects to be identified by REA (in consultation with ZESCO and following the results of the geospatial plan to be developed under the Component C). The private developers will be selected based on the tender for specific project sites to be carried out by REA. Similarly to the on-grid implementation arrangements, the implementation of the off-grid sub-projects will support the evolution of REA's role to become a facilitator for rural electrification efforts.

While the implementation of the Sub-Component bB2 will be carried out by REA directly, the Sub-Component B2 will be delegated to the Development Bank of Zambia (DBZ). Currently, the existing capacity and regulatory environment are assessed to be not ready to facilitate private sector development of off-grid projects and, therefore, the implementation of the

Component B2 activities will initially (estimated to up to 2 years) be limited to capacity building measures at the relevant institutions, including primarily the Development Bank of Zambia (DBZ). As a potential Financial Intermediary for phase 2 off-grid activities, DBZ will also have safeguard oversight responsibilities, for which it will receive appropriate capacity building under the technical assistance activities planned for phase 1, However DBZ phase two participation can only be initiated after a proper safeguard assessment is carried out to ensure it meets the World Bank's minimum requirements under OP/BP10.00.

Capacity building activities under the Component B2 Technical Assistance will be implemented by REA with required involvement and engagement of respective stakeholders, including primarily MOE, ZESCO, and DBZ. Given the close involvement of ZESCO and DBZ in implementation of the project activities, both institutions will assign dedicated project coordinators and teams to manage implementation of this project.

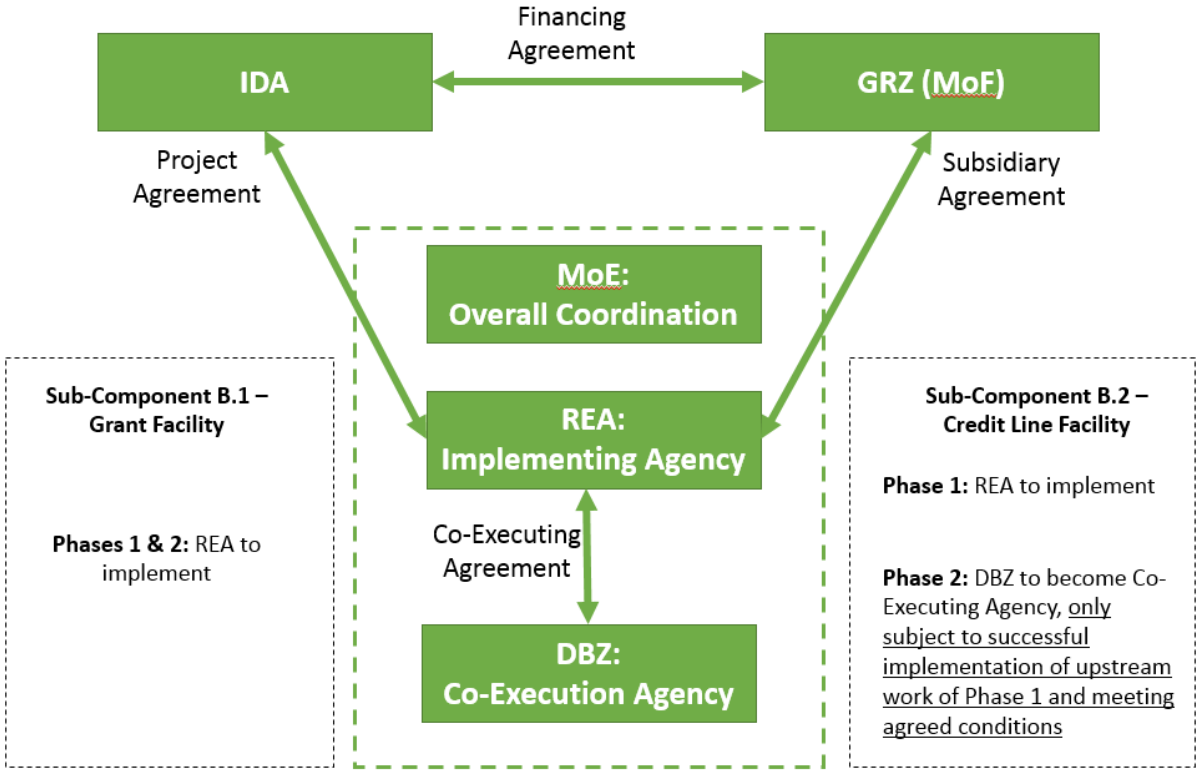

Figure 2: ESAP Project Implementation Structure - Component B - Off Grid

1.7.1 Project Steering Committee

In order to ensure efficient oversight of the Project, there shall be a Project Steering Committee, with a mandate, composition and requisite resources. The Project Steering Committee shall be chaired by the Permanent Secretary from the MoE and comprised of representatives from different public and private institutions (table 2). In order to ensure that a quorum is met at all steering committee sitting, the representatives of the various organization will be asked to official delegate a representative to represent them should they be unable to attend.

Table 2: Composition of Steering Committee

Organization	Representative on Steering Committee
Ministry of Energy	Permanent Secretary
Rural Electrification Authority	Chief Executive Officer
ZESCO	Chief Executive Officer
Ministry of Finance	Permanent Secretary
Ministry of National Planning	Permanent Secretary
Ministry of Local Government	Permanent Secretary
Development Bank of Zambia	Chief Executive Officer

The Steering Committee shall be responsible, among other things, for overseeing overall Project implementation, providing policy guidance to the project, ensuring inter-agency coordination of the Project, reviewing the annual work plans, and approving Budgets. The Committee will also consider issues to do with resettlement during the course of the project if they arise. In such cases, other relevant government departments will be coopted into the steering committee since it is envisaged that such cases are unlikely to arise.

1.7.2 Monitoring and Evaluation

In addition, the project will be designed in such a way that it would be possible to carry out an impact evaluation in order to assess the additionality of the project. The continuous M&E of the implementation of policies and key programs will be a critical role of the PIU and therefore a strong emphasis will be put on capacity building.

CHAPTER 2: ENVIRONMENTAL AND SOCIAL METHODOLOGY

2.1 Review of Literature

Secondary sources of information were obtained through a review of available documents, as well as consultations held with key stakeholders across the Country. Existing literature was the primary source for describing institutional, policy and legal frameworks. From the literature, all possible envisaged environmental and social impacts were listed and evaluated based on policy and legal requirements using matrices and maps. The data on geology and soils, climate, water resources, biodiversity, human and ecosystems were obtained from existing literature.

2.2 Analysis of Baseline Environmental Data

The ESMF recognizes the existence of available environmental baseline information. This data was compiled with the purpose of describing and evaluating the current environmental status of targeted project across Zambia. The baseline information included environmental information relevant to all project components, drawing on existing information from projects in the targeted areas. The description of the baseline environment was based on the following data:

- Physical environment: the information collected included geology, topography, soils, climate and ecosystem and hydrology.
- Biological environment: data on flora, fauna, endemic and endangered species, critical/sensitive habitats, including protected areas and reserves was collected.

2.3 Site Visits and Workshop Discussions

Several site visits were conducted as part of the design process of the project to the interventions areas in beneficially areas as well as in the surrounding districts. Additionally, several stakeholder workshops took place during the project preparation process to (Annex 10).

2.4 Analysis of Safeguard Policies and Regulations

Projects funded by the World Bank, should fully comply with the World Bank safeguard policies and the legislation in Zambia. The relevance of safeguard policies on this project's planning and implementation of the components and associated sub-projects countrywide was assessed. The World Bank Safeguard policies also require compliance to all relevant local, national and international policies and legal requirements. The chapter 3 provides the rationale for triggering the policies. The relevant national polices and legislation have been reviewed in the subsequent chapter 4. In the Zambian context, the Zambia Environmental Management Agency (ZEMA) is the competent authority in the approval of safeguards instruments and post-approval monitoring at national level. Chapter 5 outlines the analytical work, management and monitoring instruments for each of the relevant policies.

CHAPTER 3: PROJECT BASELINE INFORMATION

3.1 Baseline Information

The ESAP is aimed at increasing electricity access in targeted rural areas and enhancing the enabling environment for accelerated electrification in Zambia. In order to establish the possible environmental and social risks associated the proposed project, the baseline information includes description of the current situation in terms of the socioeconomic environment, ecological and physical environment were defined. Zambia is a landlocked country located in Southern Africa, and shares borders with Tanzania, Democratic Republic of Congo, Angola, Namibia, Botswana, Zimbabwe, Mozambique and Malawi. The country is divided into ten provinces, namely Central, Copperbelt, Eastern, Luapula, Lusaka, Northern, North-Western, Southern, Western and Muchinga (figure 2).

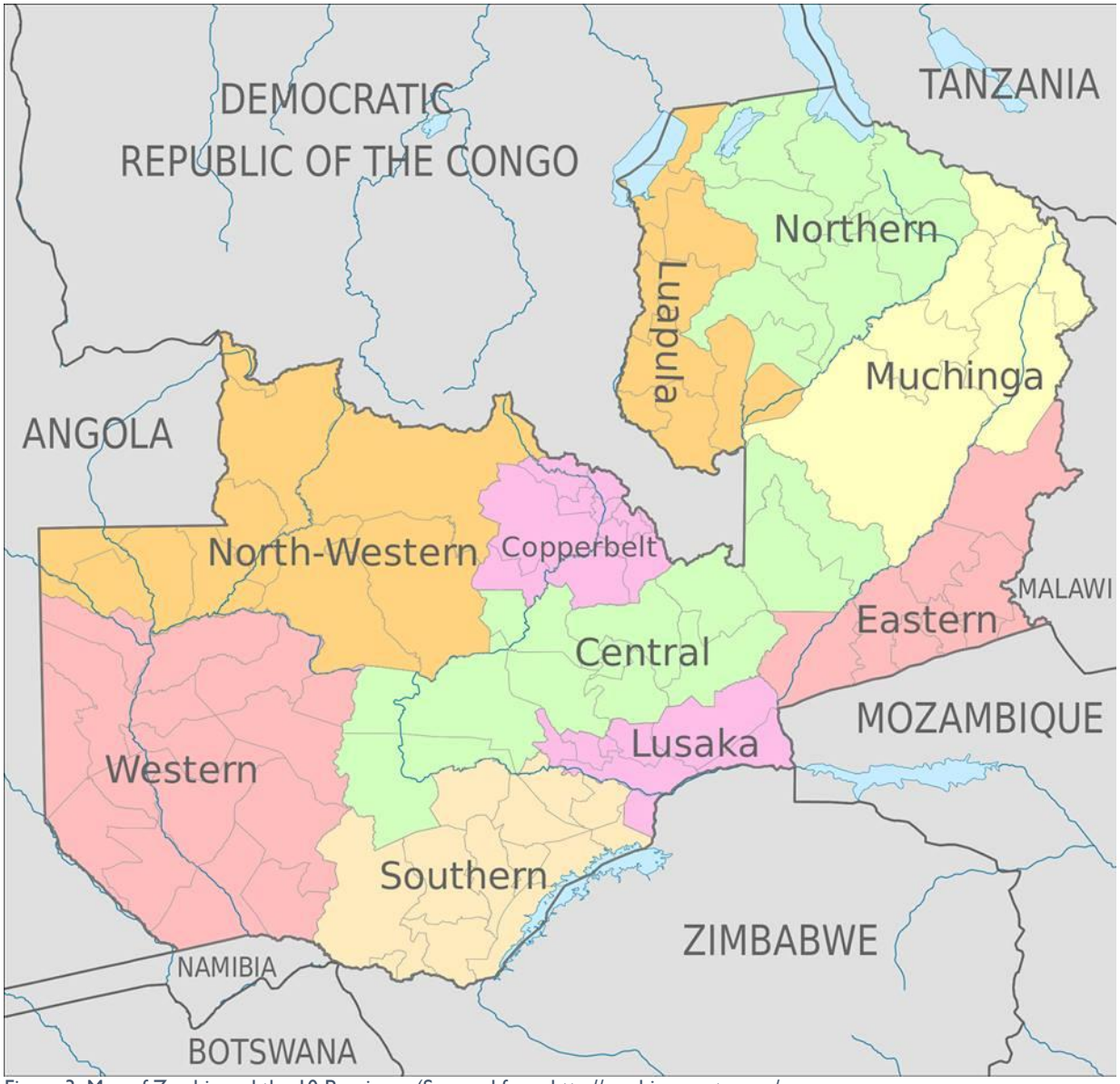

Figure 3: Map of Zambia and the 10 Provinces (Sourced from http://zambiareports.com/wp-content/uploads/2015/11/Zambian-Map.jpg)

3.2 Physical environment

3.2.1 Topography

In terms of topography Zambia is on the great plateau of Central Africa, at an average altitude of 1200m. The lower parts of the plateau have a reliable supply of water during the dry season and they are flooded in the rainy season. Zambia is high plateau, deeply entrenched by the Zambezi River (and its tributaries, the Kafue and Luangwa) and the Luapula River. The Zambezi flows to the south, turning east towards the Zimbabwe border areas. The northern part of Zambia have three major lakes namely, Tanganyika, Mweru and Bangweulu while Kariba stretches along the southern borders with Zimbabwe. In the Eastern part, the Mafinga Mountains form part of a great escarpment running down the east side of the Luangwa river valley. The country rises to a higher plateau in the east. The country has three main topographical features:

- mountains with an altitude of at least 1500m;
- a plateau with an altitude ranging from 900 to 1500 m; and
- lowlands with an altitude of between 400 and 900m.

3.2.2 Soils

Soils in Zambia have been formed from a great diversity of parent materials. However, the characteristics and distribution of the soils are largely influenced by climate particularly rainfall. Zambia lies roughly between latitudes 8°and 18° south of the equator. Zambia experiences strongly clear rainy and dry seasons, the rainy season starts late October in the north and November in the south and lasts up to April and March respectively. Mean annual rainfall exceeds 1100mm in the western part of Northern and the northern part of North-Western Provinces, decreasing southward to Southern Province, only 700mm in southeastern margin of the country. Mean annual temperatures range between 19 – 22°C except in the major river valleys of Zambezi, Luangwa and Luapula. Zambia ranges roughly between 600m and 2000m in the elevation, and it consists of level to gently undulating plateau except the escarpments zones which divide the middle Zambezi and Luangwa valleys.

Geomorphology of Zambia has shown the first four legends as Montane Zone, Central African Plateau, Escarpment Zone and Rift Trough, respectively. The latter two topographical features show the elevation from transitional to lower one. Zambia is underlain by a wide range of rock types. Except the Kalahari system that has been formed from the tertiary to recent period and has covered the west and north-west side of the country, such igneous rocks as granite, gabbro and others in various ages probably older than the Pre-Cambrian period, and the Basement complex which consisted of ancient crystalline rocks like schist, gneiss, quartzite and migmatite in the Pre-Cambrian period formed the Central African Plateau in the north, east and south-east side of the country. In the south-west, west and north-west side of the country, such sedimentary rocks as shale, sandstone, mudstone and limestone in the Katanga system, and in the east, south-east side of the country, lava (basalt), marl, sandstone and others in the Karroo system both from the Lower Paleozoic to the Mesozoic periods also formed the stable land blocks overlying the Basement Complex. These systems and the Complex accompanied by repeated folding and metamorphism through the geological ages have altered the original of the rocks, followed by their slow protrusion, erosion and weathering, various types of soils were formed (figure 3).

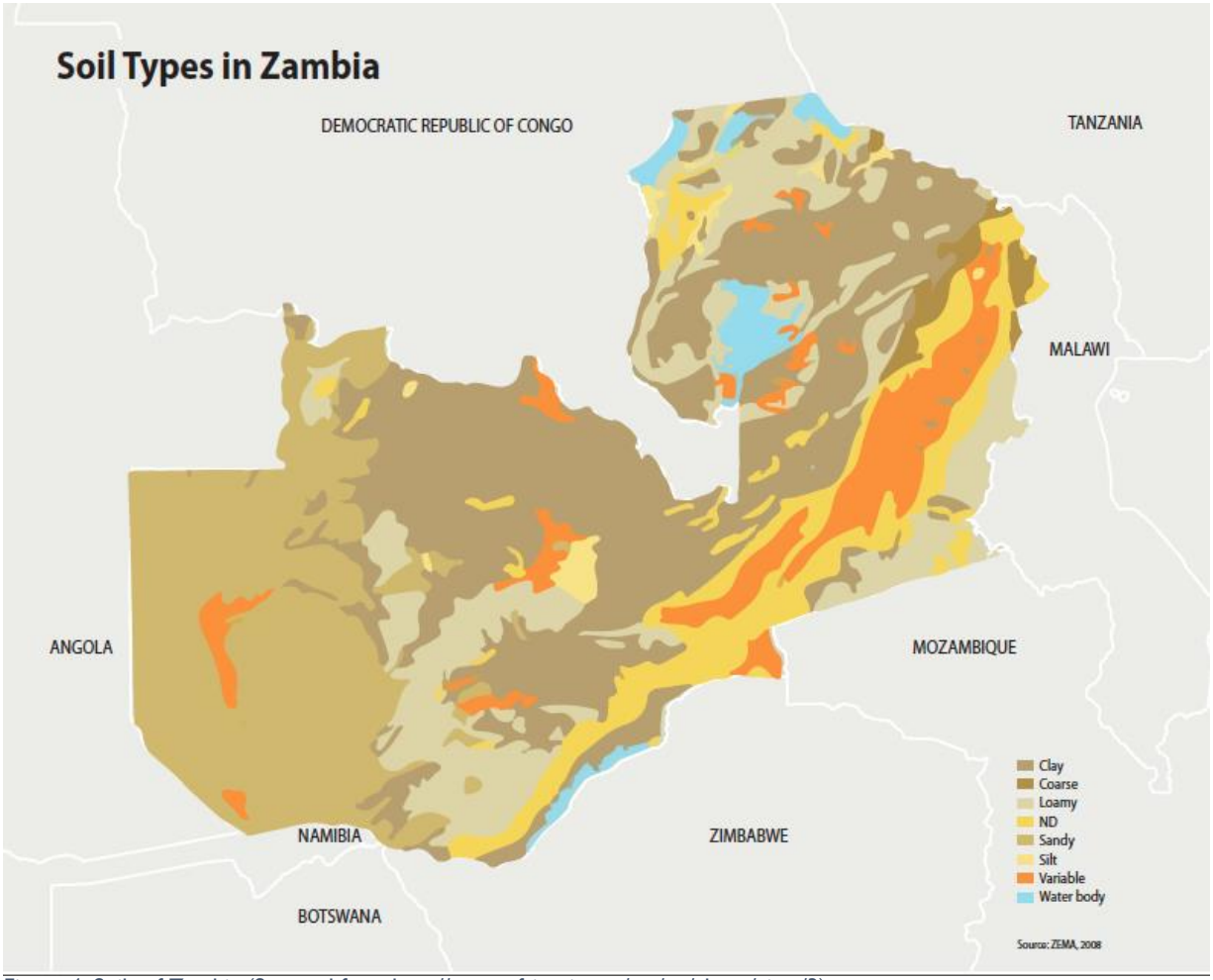

Figure 4: Soils of Zambia (Sourced from http://www.africaein.net/zm/en/about/view/3)

3.3.1 Hydrology

Zambia is drained by the Congo in the north and Zambezi in the south. The main Zambezi drainage system occupies most of the western portion of the country and some discontinuous areas in the south. The Kafue system originates in the Copperbelt region and drains the central region of the country. The Luangwa system, with its tributary of Lunsemfwa, drains much of the eastern parts of the country. In the north the Chambeshi River originates in the north-east and drains much of the southern parts of Northern Province before discharging into the Bangweulu swamps. The drainage into Lake Tanganyika in the north consists of the Lufubu and some minor streams (figure 4).

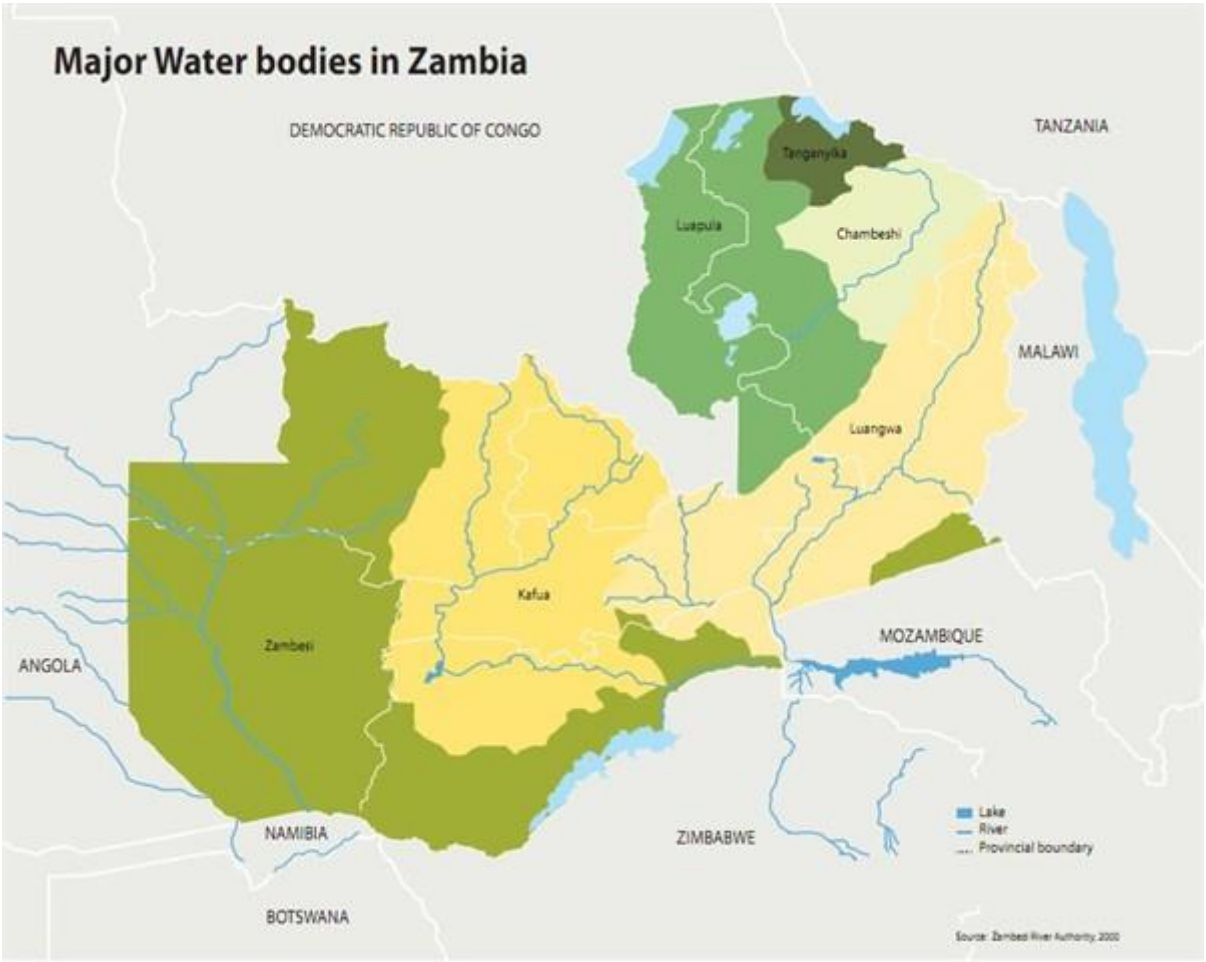

Figure 5: Major water bodies in Zambia (Sourced from http://www.africaein.net/zm/en/about/view/3)

Almost all the rainfall in the country falls during the period November to April, so that the dry season months of May to October do not contribute to stream flow. Consequently, most small streams dry up while in the many larger streams flow is reduced to a small fraction of the wet season discharge. Surplus water (i.e., the amount of precipitation that goes to stream flow and groundwater recharge) varies throughout the country but ranges from 150 – 550 mm in the Copperbelt and Northern Provinces and northern parts of eastern Province to 50 – 100 mm in Central, Lusaka, Southern and Western Provinces and the southern parts of eastern Province. Runoff in the Luangwa basin is approximately 13% of the mean yearly rainfall compared to 24% in the Kafue basin. The quality of water is generally good except in the Kafue River system where surface water may be contaminated in some places due to industrial, urban and agriculture activities. Natural wetlands in the form of swamps and floodplains hold considerable amounts of runoff water but also lose a lot of water through evaporation especially in the dry season. Dambos are seasonal wetlands that are waterlogged during the wet season and occur in the upper reaches of drainage systems and constitute up to 10% or more of the landscape on the plateau (figure 5).

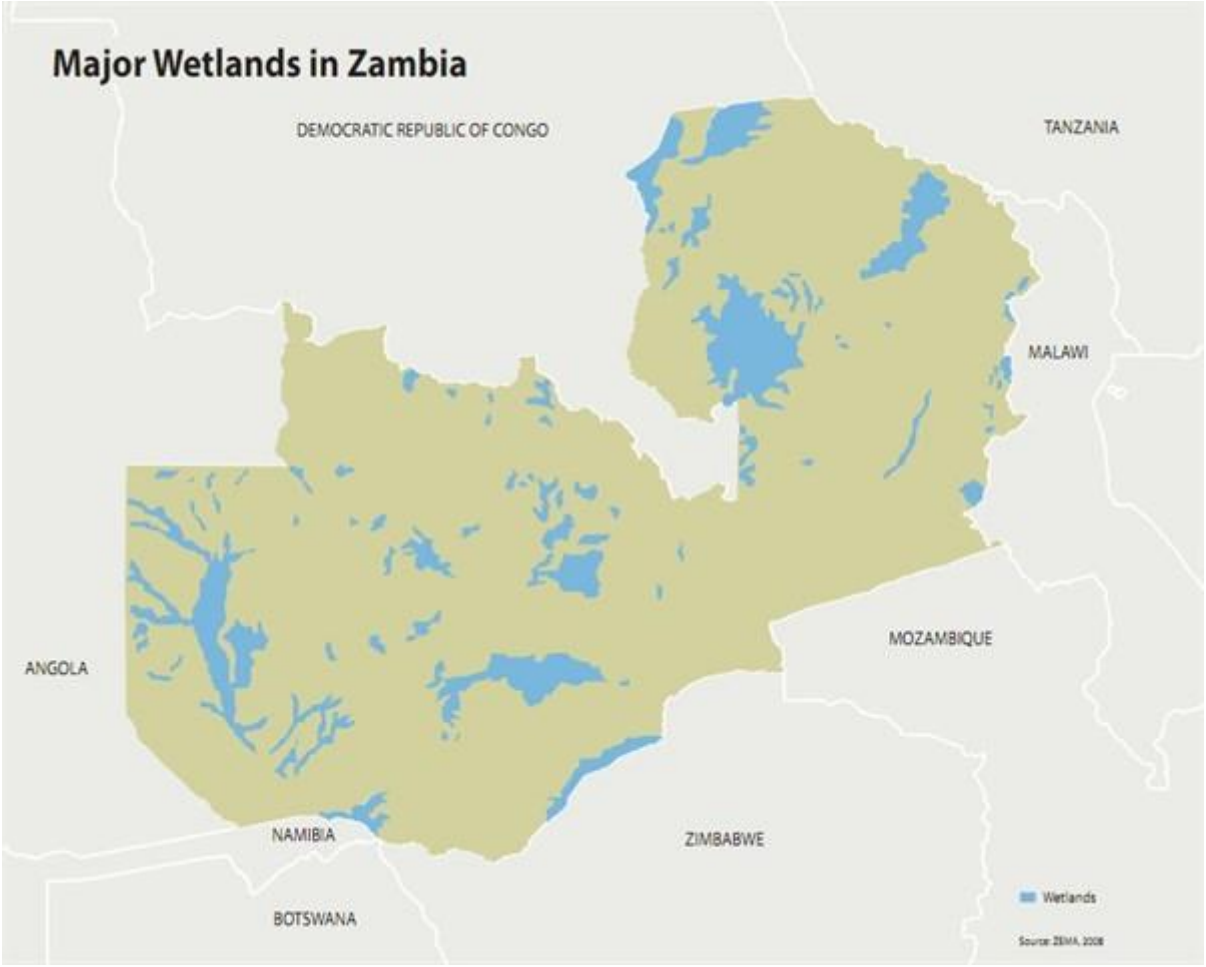

Figure 6: Major Wetlands in Zambia (Sourced from http://www.africaein.net/zm/en/about/view/3)

3.3.2 Climate

The climate in Zambia is characterized by alternating wet (rainy) and dry seasons. The rainy season lasts from November to March or April. Rainfall in Zambia is influenced by the southward movement of the equatorial low pressure belt in the summer months that is linked to the migration of the overhead sun and the Inter-Tropical Convergence Zone (ITCZ) which is a zone in which the Congo air and southeast and northeast trade winds converge. The mean annual rainfall distribution in Zambia is characterized by a decrease from north to south (Figure 4.2) that may be attributed to the shorter time the south is influenced by the ITCZ. The coefficient of variation (CV) of annual precipitation currently ranges from 10 – 20% in Copperbelt and Northern Provinces and the northern districts of Kalabo and Lukulu in Western Province to 20 – 30% in Central, Eastern, Lusaka and Southern Provinces and the rest of Western Province.

In the north, rainfall is 1,250 mm or more a year decreasing southwards to Lusaka where it is about 750 mm. South of Lusaka climate is dictated more by the east and southeast trade winds which have lost much of their humidity so far inland. Rainfall in this area is between 500 and 750 mm. In some years the influence of the tropical zone is felt further to the south, resulting in excessive rain in the Southern Province and partial drought in the north. Except for very rare showers in August, rain is confined to the wet season, which sometimes starts as early as October and finishes as early as March. At the height of the rainy season, it rains on seven or eight days out of ten.

Average temperatures are moderated by the height of the plateau. Maxima vary from 15 - 27°C in the cool season with morning and evening temperatures as low as 6 - 10°C and occasional frost on calm nights in valleys and hollows which are sheltered from the wind. In the cool season, the prevailing winds, dry south easterlies, come from the southern hemisphere belt of high pressure. Invasions of cold air from the south-east bring cloudy to overcast conditions. During the hot season maximum temperatures may range from 27 - 35°C. However, the mean annual temperature ranges between 18 - 20°C. The highest annual average temperature is 32°C and the lowest temperature averages 4°C. Annual temperature variation is greatest at Livingstone, the most southerly town and least at Mbala, the town nearest the equator.

3.3.3 Climate Change and Impacts on the Power Sector

For many developing countries in Sub-Saharan Africa (SSA), electricity generation is hydro-based, with only Botswana, South Africa, Tanzania, and Angola producing significant amounts of power using other sources. As such, power shortages are usually associated with droughts and erratic rainfall patterns. Despite the rapidly growing electricity demand by various consumers, there have been limited investments in expanding electricity generation capacity, with few efforts made to replace the ageing electricity infrastructure. What is also clear is that there is very little diversity in the energy generation mix, with only Angola, Zimbabwe, and Tanzania generating significant amounts of power from other generation sources than hydro (IAPRI, 2016).

Without adaptation, the societal consequences of this general drying trend, with more frequent intense rainfall events, could be profound. The agricultural sector can be expected to suffer greatly from the decline in total precipitation and the shortening of the growing season; as a result, production is likely to decrease. When precipitation does come, the quantity and run-off may be so great that it will benefit the crops only minimally, potentially even doing more harm than good, inundating fields and destroying crops. Similarly, access to safe drinking water is likely to diminish, putting stress on both cities and rural areas. Cities which currently rely on boreholes and shallow wells risk depleting their sources, while rural communities dependent upon shallow wells and surface water will have to travel greater distances to collect drinking water, increasing incidences of water-borne diseases (cholera and dysentery) and human-wildlife conflicts. More frequent extreme precipitation events may also result in a rise in water-borne diseases. Flash flooding events could result in more frequent contamination of the water supply, and communities already stressed with limited water supply may see a rise in the number of cholera cases. The energy sector is also very threatened by this expected trend. A 2010 World Bank assessment of hydropower in Southern Africa, including Zambia, simulated a reduction in annual average energy production of 21%. Reservoir levels behind the hydroelectric generation dams are expected to decrease on an annual basis as a result of more frequent and prolonged drought conditions. This combined with increased surface water evaporation, especially from upstream reservoirs and flood plains, could result in reduced energy generation capacity throughout Zambia.

3.3 Ecological

3.3.1 Forests

There are 480 forest reserves in Zambia covering a total land area of about 7.2 million hectares Local forests are meant to conserve forest resources for sustainable use by local people, while National Forests protect major catchment areas. Several if not most of the National Forests

overlap Game Management Areas (GMAs). As a result of expanding settlements and agriculture activities some forest reserves have been encroached upon and depleted. Consequently the Government has excised and degazzeted some reserves, reducing the area and number of forests. According to Zambia's Fourth National Report on Implementation of the Convention on Biological Diversity (CBD), about 249 Forest Reserves (51%) are either encroached or depleted due to over-exploitation of wood products, settlement, cultivation and inadequate natural resources governance. This has resulted in the loss of forest reserves - whose numbers have reduced and changed to other land uses. About 2% of the National Forests are "depleted," while 46% are "encroached" and 52% are "intact." Seventeen Forest Reserves have been degazetted for other land use, representing about 3% of the total area of Forest Reserves. More local forests have been excised than National Forests. Local forests in the Copperbelt, and in Eastern and Lusaka Provinces have been more affected than those elsewhere. This may be attributed to high urbanization leading to high demand for forest products and land. It is expected that the opening of new mines in Northwestern Province will bring pressure on the undisturbed forest reserves.

3.3.2 Biodiversity

It is estimated that there are about 7,774 species of organisms that occur in Zambia with micro-organisms comprising 8%, plants 47%, and fauna 45% of this biodiversity. The diversity of fauna has been estimated at 3,407 species, of which 1,808 are invertebrates, 224 are mammals, 409 are fish, 67 are amphibians, 150 are reptiles, and 733 are birds. Floristic diversity is dominated by herbs and woody plants with an estimated 4,600 species of flora, of which 211 are endemic. There are 19 National Parks established to conserve faunal biodiversity, comprising about 8% of the total land area. Table 2 below shows the list of endangered and vulnerable species across Zambia.

Table 3: List of Endangered and Vulnerable species in Zambia.Based on Chidumayo and Aongola (1998).

Group/ Subgroup	Species (Common name)	Threat status
Fauna		
Mammalia	*Crocidura ansellorum*	Endangered
	Crocidura pitmani	Vulnerable
	Rhynchocyon cirnei (Checkered Elephant shrew)	Vulnerable
	Plerotes anchietae	Vulnerable
	Pipistrellus anchietae	Vulnerable
	Otomops martiensseni	Vulnerable
	Lycaon pictus(African wild dog)	Endangered
	Acinoyx jubatus (Cheetah)	Vulnerable
	Panthera lea (Lion)	Vulnerable
	Loxodonta africana (Elephant)	Endangered
	Diceros bicornis (Black rhinoceros)	Endangered
	Kobus leche kafuensis (Kafue lechwe)	Vulnerable
	Kobus leche smithemani (Black lechwe)	Vulnerable
Aves	*Egretta vinaceigula* (Slaty Egret)	Vulnerable
	Falco fasciinucha (Taita Falcon)	Vulnerable
	Falco naumanni (Lesser Kestrel)	Vulnerable
	Bugeranus caranculatus (Wattled Crane)	Vulnerable
	Crex (Corncrake)	Vulnerable
	Sarothrura ayresi (White-winged Flufftail)	Endangered
	Agapornis nigrigenis (Black-cheeked Lovebird)	Endangered
	Pogoniulus makawai (White-chested Tinkerbird)	Vulnerable
	Hirundo atrocaerulea (Blue Swallow)	Vulnerable

Insecta	*Erikssonia acraeina*	Vulnerable
	Monardithemis flava	Vulnerable
	Lanistes neavei	Vulnerable
	Bellamya crawshayi	Endangered
	Bellamya mweruensis	Endangered
	Bellamya pagodiformis	Endangered
Trees	*Pterocarpus angolensis*	Locally Vulnerable
	Afzelia quanzensis	Locally Vulnerable
	Daniela ostiniana	Locally Vulnerable
	Khaya nyasica	Locally Vulnerable
	Mitragyna stipulosa	Locally Vulnerable

Most of these parks were set aside during the Colonial Era and formally established after Zambia's independence in the early 1970s. Sustainable use of wildlife and its habitats in the parks is promoted through eco-tourism while settlements and hunting are prohibited. It is important to note that only the surface of land contained within parks is protected; subsurface mineral deposits are not withdrawn from entry. The Ministry of Mines and Minerals Development controls the extraction of all minerals in Zambia (IRG, 2011).

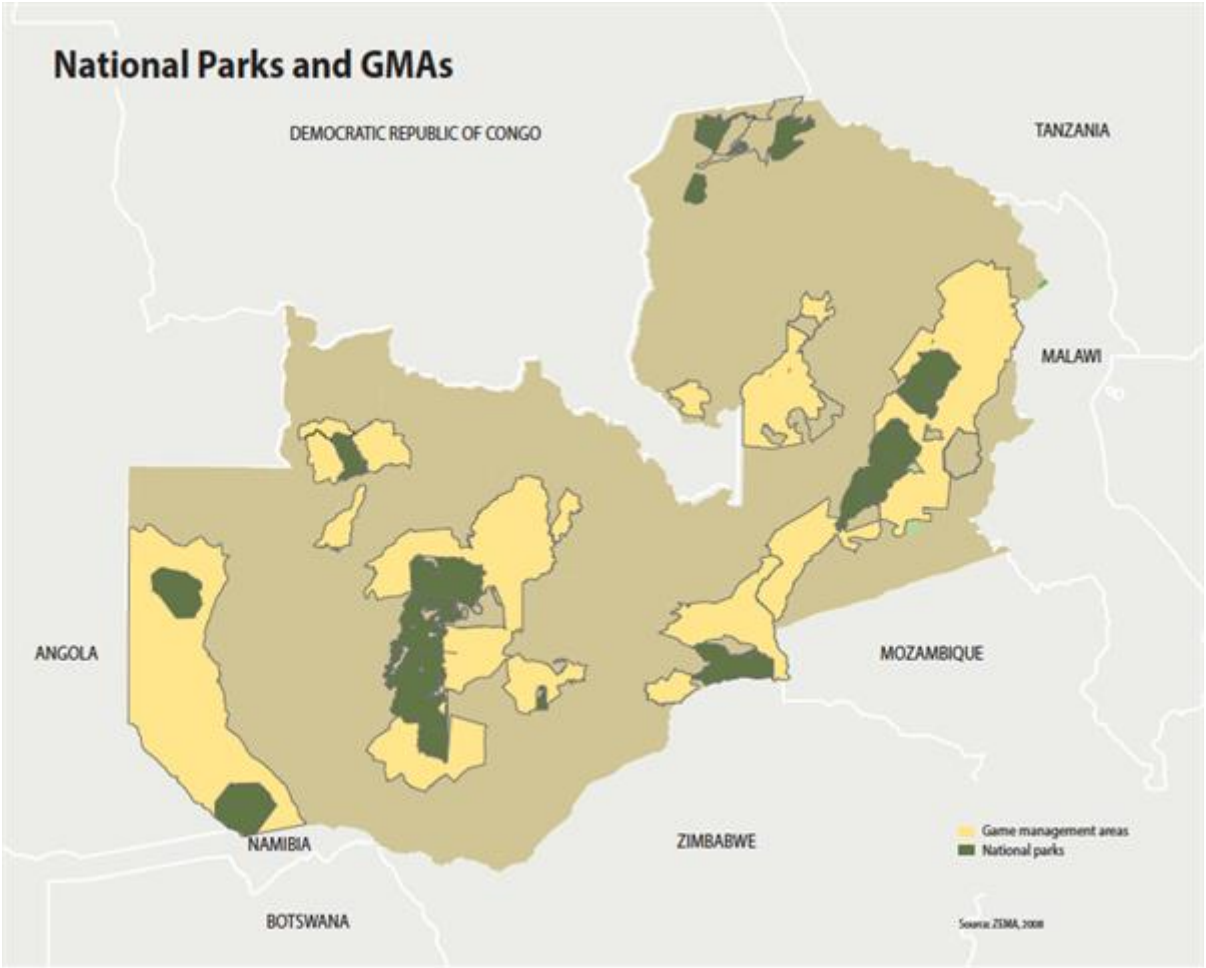

Figure 7: National Parks and Game Management Areas Across Zambia (Sourced from http://www.africaein.net/zm/en/about/view/3)

Game Management Areas are protected areas established by law to control the hunting of wild animals through a licensing system. There are 36 GMAs that were essentially set up as buffer zones to the National Parks, covering an additional 23% of the land area (figure 6). The GMAs are communally owned areas where human habitation is permissible, along with economic activities that are not detrimental to wildlife management. Additionally, Zambia has eight designated Ramsar sites covering more than 4 million ha and 39 Important Bird Areas, 15 of which overlap with national parks. Within the National Forest system, 59 botanical reserves have been established to conserve floral biodiversity; 29 of these reserves are either encroached or depleted with a variety of reasons cited such as unmaintained reserve boundaries and inadequate capacity within the Forestry Department. The 4th National Report estimated that 31 species are endangered or vulnerable (i.e. *threatened*); however a recent query of the International Union for the Conservation of Nature (IUCN) Red List found an increase in this number to 47. Of these *threatened* species, five are considered *critically endangered*, 12 are *endangered*, and another 30 are considered *vulnerable*. It is difficult to determine whether the increase in the number of threatened species can be attributed to a decrease in populations or if better assessments have been undertaken, improving the baseline data. Many of these endangered and critically endangered listed species are aquatic organisms found in select lakes or river systems in Zambia and are primarily threatened by siltation, dams, direct or indirect poisoning, or competition from non-native species (IRG, 2011).

3.3.3 Ecosystems and Land Cover

Based on the vegetation of Zambia, there are 16 main ecosystems in the country. These ecosystems are dynamic due to the influence of climate and geomorphological processes. Over the last million years, there have been drastic changes in the extent of these ecosystems which have been triggered by changes in climate. In recent times, biotic factors, such as cultivation, fire and herbivory, have played a significant role in altering the structure and functioning of these ecosystems. These are important considerations in biodiversity management. Ecosystems with the highest species biodiversity are Acacia savanna (munga) and *Brachystegia-Julbenardia* (miombo) woodlands followed by *Colosphospermum* (mopane) woodland and floodplain/swamp grassland. Termitary is a transition ecosystem between wetland grassland and upland woodland that is characterized by wooded termite mounds (termitary) surrounded by grassland and is important for grazing (figure 7). Montane forest, although of limited extent in the country, has the highest number of endemic woody plants. The diversity of ferns and orchids is correlated to ecosystem diversity. The diversity of some invertebrates (Arachnids and butterflies) and ferns shows a south-north increase while that of other invertebrates *(Hemiptera and Hymenoptera)* shows the opposite trend. These diversity gradients are related to rainfall/moisture gradient (IRG, 2011).

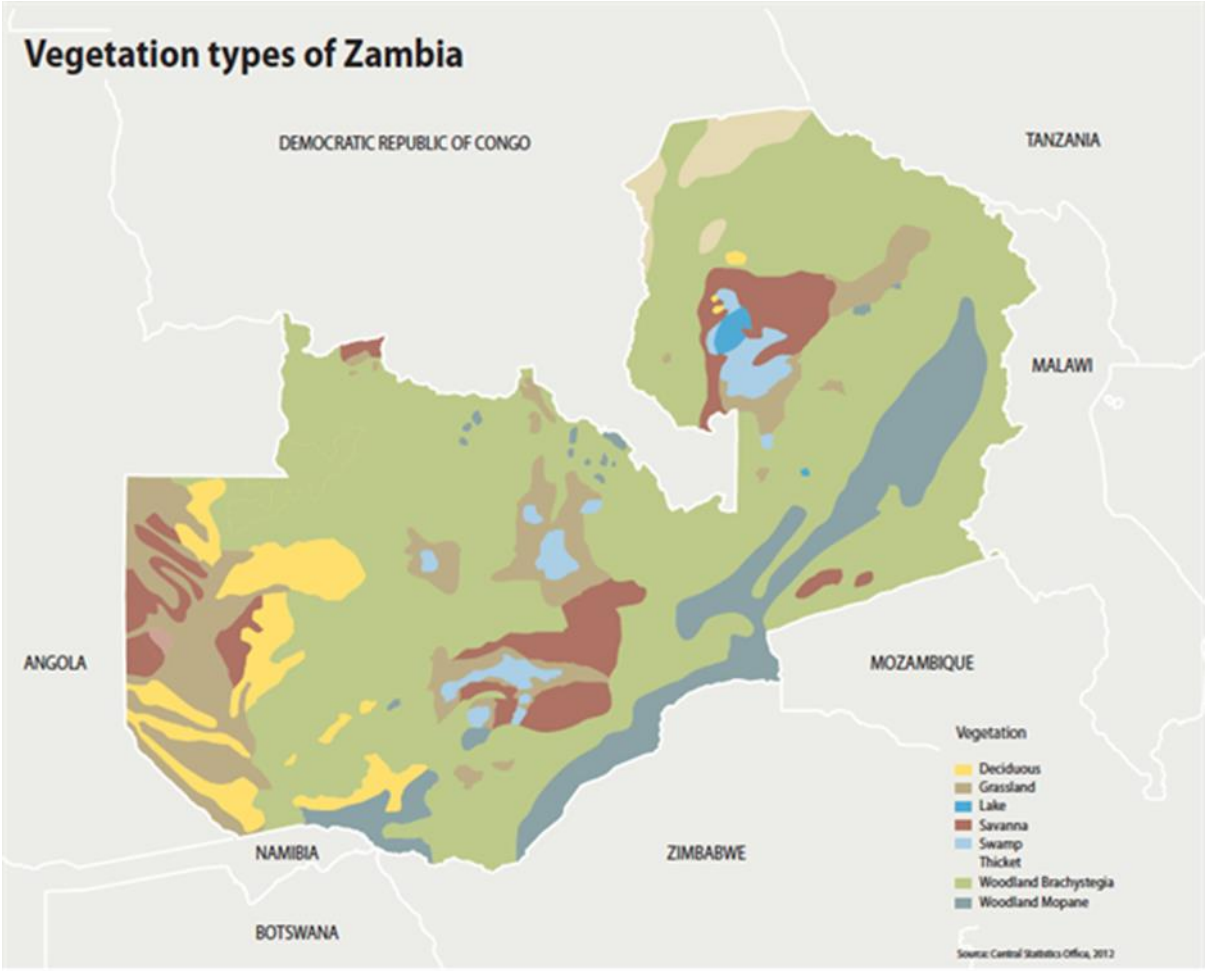

Figure 8: Vegetation types of Zambia

3.3.4 Agro-ecological Regions

The agro-ecology of Zambia is roughly divided into three regions according to the rainfall and soil characters. The following is the general features of these three regions (figure 8).

ZAMBIA'S AGRO-ECOLOGICAL REGIONS

AER 1	AER 2 (A & B)	AER 3
17.3 m hectares	27.4 m hectares	30.6 m hectares
Less than 800 mm rainfall per year	800 mm to 1,000 mm rainfall per year	More than 1,000 mm rainfall per year
80–120 growing days	100–140 growing days	160+ growing days
Suitable for millet, sorghum, lentils, bananas, paprika, baby corn, small ruminants, cattle, dairy, aquaculture and poultry.	Suitable for maize, sorghum, cassava, millet, rice, groundnuts, cow peas, tobacco, sunflowers, irrigated wheat, soybeans, horticulture, aquaculture, cattle, dairy and poultry.	Suitable for cassava, maize, millet, sorghum, beans, groundnuts, rice, coffee, tea, pineapples, cattle, dairy, poultry, small ruminants and aquaculture.

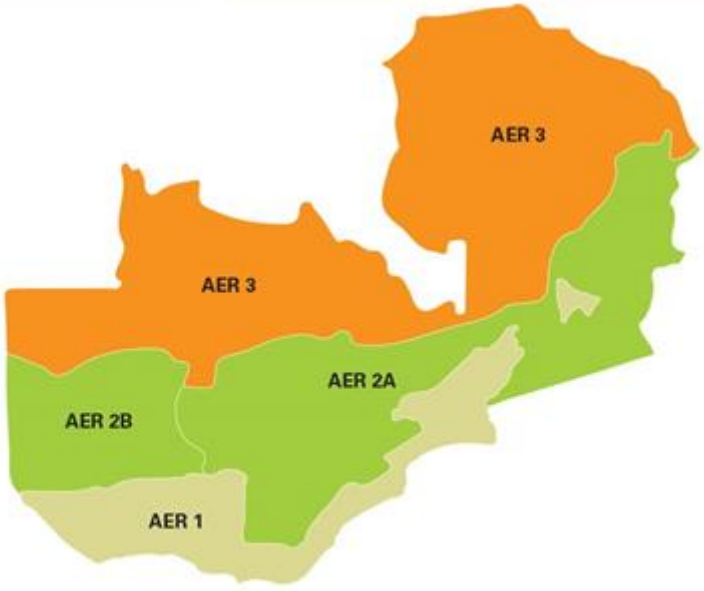

Figure 9: Agro-ecological Regions of Zambia

Region I

The Region with less than 800 mm of annual rainfall accounts for 12% of the total land area. The total acreage amounts to 17.3 million hectares, the smallest among the three regions. The region includes: the arid zone covering South Province, East Province, the Gwembe Valley of Central Province, and the semi-arid zone of West and South Provinces. The planting season of crops is short normally in the range of 80 -120 days. Accordingly it is suitable for growing such the drought resisting crops as millet, sorghum, sesame and cotton. With irrigation, however, maize can be cultivated even in dry season. The region is also suitable for raising cattle, while the cultivation of cassava is limited. The valley area along the Zambezi River is lowland, consequently the temperature and humidity are high. Due to the habitat of tsetse flies, cattle raising is not feasible (JAICAF, 2008).

Region II

The Region is located at the center of the country, and includes Western Province, Central Province and Eastern Province and a part of Northern Province. Total acreage amounts to about 27.4million hectares, accounting for 42% of the total national acreage, ranking at the second among the three regions. From the aspect of agricultural uses, the soil appears most fertile. The annual rainfall is 800-1000 mm and no freezing even during the low temperature season. The crop planting period is for 100-140 days. Region II is further divided into II-a and II-b Sub-Regions. The II-a Sub-Region is located in the fertile plateau covering the four provinces of Central, Lusaka, Southern and Eastern, generally with the original fertile soil. There the sedentary agriculture develops, and such various crops as maize, cotton, tobacco, sunflower, soybean, groundnut and wheat by irrigation are planted. The area is also suitable for flowers and vegetable production like paprika. The Sub-Region II-b is included in Western Province, where sandy soil is predominant. The area is suitable for the production of cashew nut, rice, cassava, millet, vegetables, timbers, and livestock
production like beef, dairy and poultry (JAICAF, 2008).

Region III
The Region is one of the highest rainfall areas with the average annual rainfall of 1,000-1,500 mm. The period suitable for crop production is 120-150 days. The region accounts for 46% of the whole national acreage, and covers Northern Province, Luapula Province, Copperbelt Province, the most part of Northwest Province, and a part of Central Province. Except Copperbelt Province, the soil in the Region is in an advanced stage of leaching and acidification, yet in applying the lime it can be used as farmland. It is suitable for the production of millet, cassava, sorghum, beans and groundnut. Coffee, sugarcane, rice and pineapple are also planted. The stream water without interruption throughout the year can be utilized for small-scale irrigation. Development of freshwater fish and aquaculture are also expected (JAICAF, 2008).

3.3.5 Protected Areas
The Convention on Biological Diversity (CBD) defines a protected area as a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives. Similarly, in-situ conservation refers to the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

The protected area system in Zambia consists of national parks (IUCN protected area category II), bird sanctuaries (IUCN protected area category IV), game management areas (GMAs, IUCN protected area category VIII), important bird areas (IBAs, IUCN protected area category IV), forest and botanical reserves (IUCN protected area categories IV and VIII) and national heritage sites (IUCN protected area categories III and X). National parks were established by government primarily for the conservation of biodiversity. There are 19 national parks in Zambia and these cover a total area of 6.358 million hectares (ha). Sustainable use of wildlife and its habitats in national parks is promoted through eco-tourism while settlements and hunting are prohibited.

Bird sanctuaries have the same status as national parks but are usually smaller in size. There are two bird sanctuaries in the country. Important Bird Areas (IBAs) are identified based on internationally agreed criteria and are established for the long term viability of naturally occurring bird populations across the range of those species for which a site-based conservation approach is appropriate. There are 42 IBAs in Zambia and some of these are in

national parks and these also include the two Ramsar sites (Bangweulu Swamps and Kafue Flats) in the country. Game management areas (GMAs) were established by government to control the hunting of game and protected animals through a licensing and monitoring system. There are 34 GMAs in Zambia which cover a total of 16.57 million ha. Because other forms of land use, such as settlements and agriculture are allowed, GMAs are not strictly protected areas.

Forest reserves were established by government to conserve forest resources for sustainable use by local people in the case of local forests and to protect major catchment areas and biodiversity in the case of national forests. There are 432 forest reserves in Zambia which cover a total of 7.4 million ha. Settlements and cultivation are normally not permitted in forest reserves while removal of any plant is only permissible under license as is livestock grazing. Other forest reserves are managed as botanical reserves that serve three objectives: (i) preservation of relic vegetation types and/or plant species, (ii) genetic banks for multiplication and breeding programs, (ii) reference sites in determining human impacts on forest ecosystems outside reserves. There are 59 botanical reserves in Zambia which cover a total area of 148,000 ha but form part of the country's forest reserve system.

3.4 The Zambian Power Sector and Social Outlook

3.4.1 The Power Sector

The Zambia electricity sector is composed of the state-owned, vertically-integrated utility named ZESCO, a private company that generates power to the grid and manages off-grid small hydro systems called the Lunsemfwa Hydro Power Company (LHPC), and the Copperbelt Energy Company (CEC); the latter provides electricity to the bulk of the mining sector from power purchased from ZESCO, and through its own gas-fired power plants. Finally the Zengamina Hydro Power Company (ZHPC) and the North West Energy Corporation (NWEC) distribute electricity to rural mining communities from off grid mini hydro plants and the national grid, respectively (Figure 9). ZESCO, the CEC and the LHPC are currently the major power generators with shares of 94%, 4% and 2%, respectively. With regard to transmission activities, the respective shares are 69%, 29%, and 2%. Electricity demand grew by an average rate of 3.5% between 2002 and 2010 with about 45% consumed by the mining industry, 30% by the residential sector, 15% by the commerce and industry sectors and the rest consumed by export, social and agricultural services.

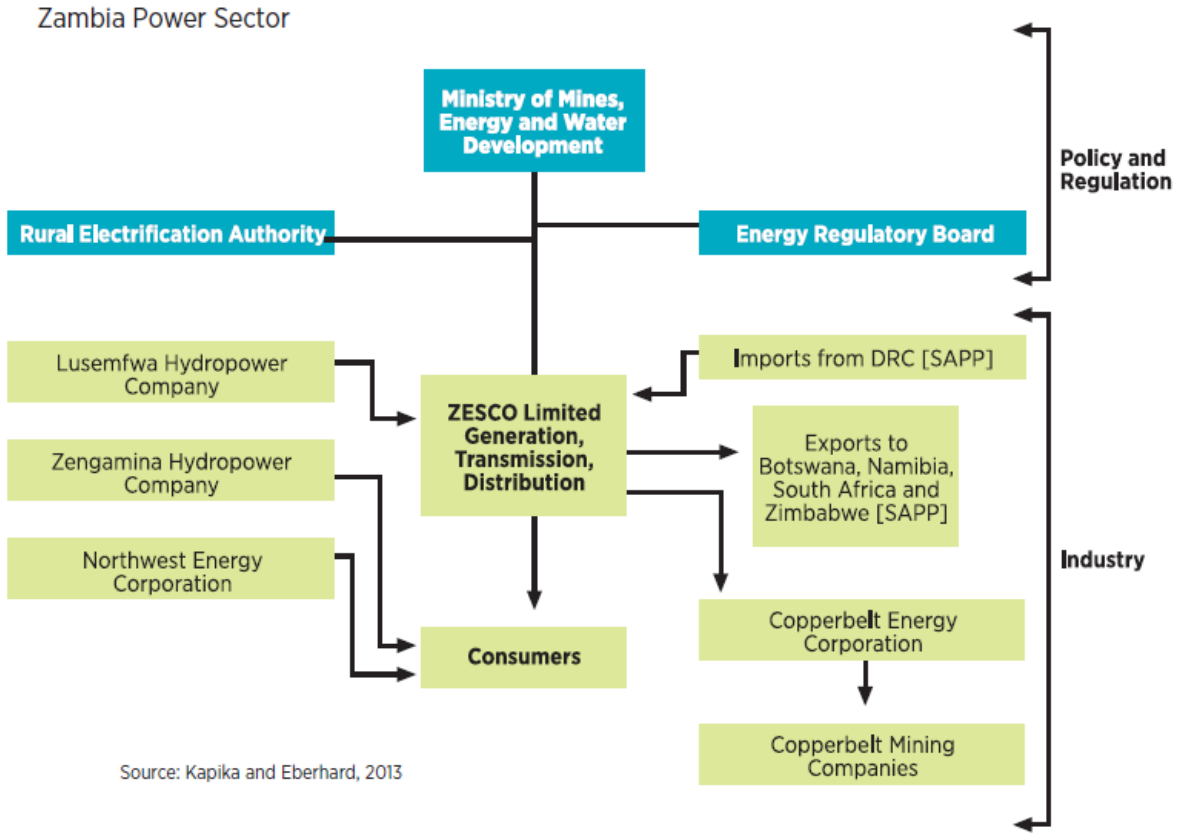

Figure 10: The Zambian Power Sector

Almost all Zambia's domestic power is sourced from hydroelectric power stations, with only small amounts coming from thermal sources. However, the government has recently scaled up its ambitions for expanding electricity generation in order boost economic growth. New mining, oil and gas resources will require significant additional capacity to fulfil their potential

while plans to expand access to the grid will bring many more consumers online. In this context, the country's state power utility, Zambia Electricity Supply Corporation (ZESCO), plans to invest US$5bn by 2022 in refurbishing existing power projects and constructing new generation stations in collaboration with the private sector. These include the 750MW Kafue Gorge Lower hydropower project; the 1,600MW Batoka hydro-electricity project between Zambia and Zimbabwe; the Kalungwishi hydropower scheme; and the thermal power plant being built by Maamba Collieries. In the short term, production is expected to increase by around 600MW as the Kariba North Bank extension and Maamba power plant begin production, and as the 120MW Itezhi-Tezhi Hydro-Power generating station comes online (figure 10 and 11) (BMI, 2015).

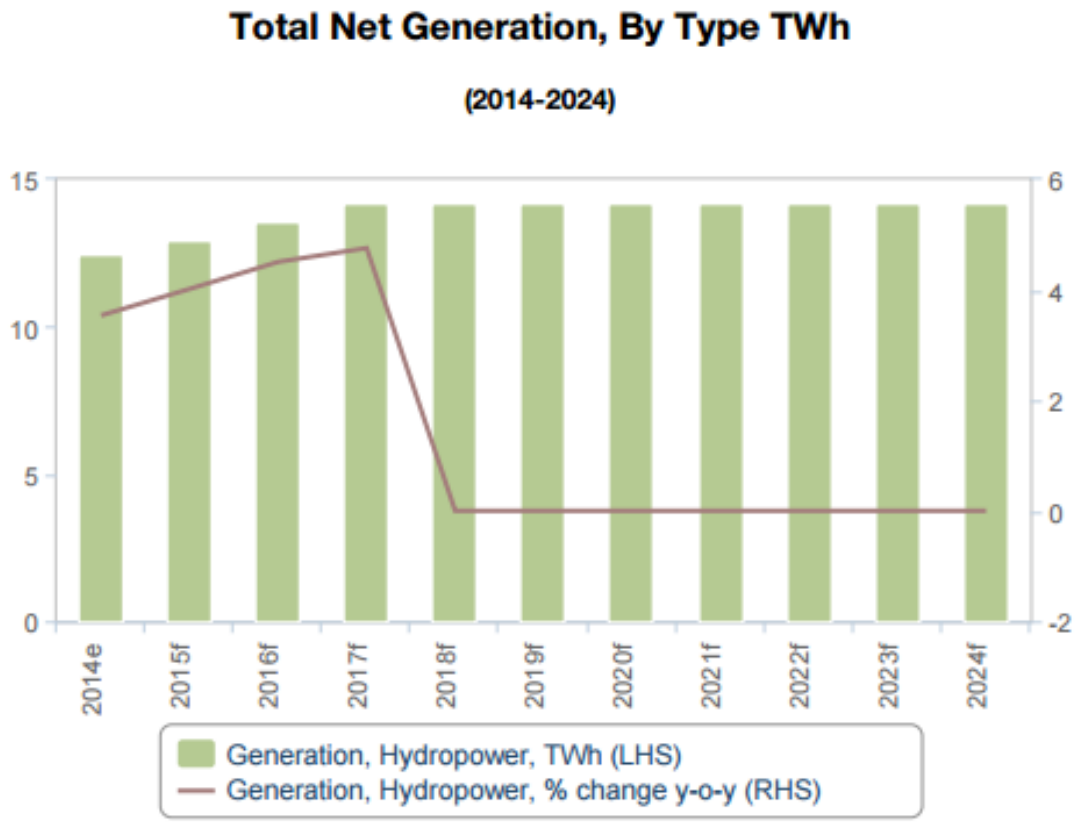

Figure 11: Total Net Generation for Hydropower – Zambia, (BMI, 2015)

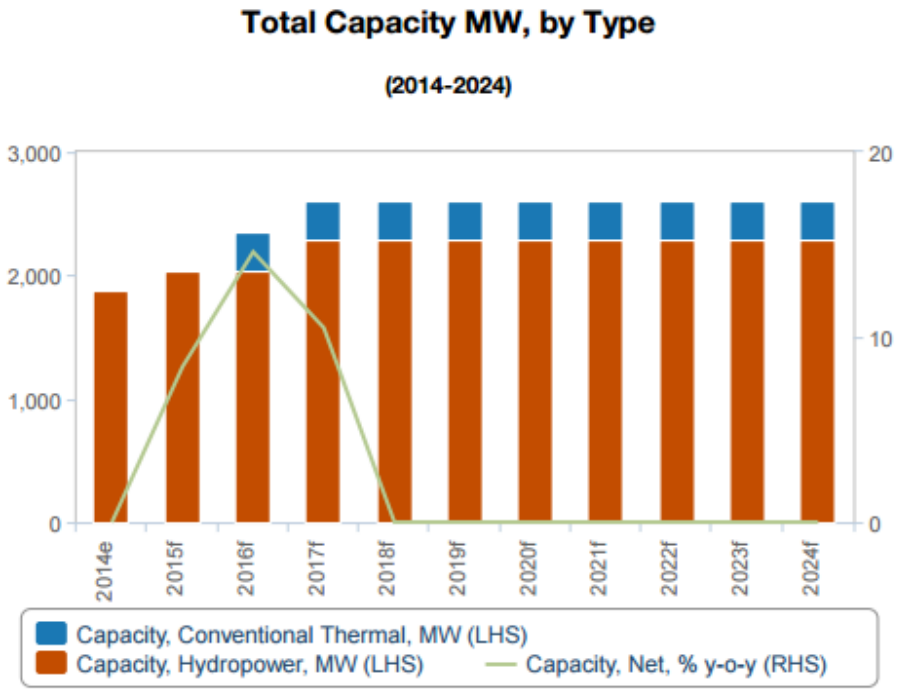

Figure 12; Total Generation of Hydropower and Conventional Thermal (BMI, 2015)

3.4.2 Southern African Power Pool (SAPP)

In 1995, 12 Southern African Development Community (SADC) member countries signed an inter-governmental memorandum of understanding (MoU) that led to the creation of the Southern African Power Pool (SAPP) with the aim of creating a common market for electricity that would provide reliable and economical electricity to the consumers in each SAPP member country, optimise the use of available energy resources in the region, and support inter-country co-operation during emergencies. This initiative has been furthered by the 1996 signing of the Regional Energy Protocol, which recognizes the need for a co-ordinated approach to energy strategy formulation and planning for the SADC. The interconnected grid is operated through three control areas run by Eskom (for Botswana, Lesotho, Southern Mozambique, Namibia, Swaziland and South Africa), Zimbabwe Electricity Supply Authority (for Zimbabwe and Northern Mozambique) and ZESCO (for the DRC and Zambia). The three utilities, or the system operators, are responsible for balancing electricity supply and demand and power flows within their control areas. Besides being one of the control area operators, Zambia plays a critical role in the SAPP, both as a supplier of hydropower from the Zambezi River Basin, but also an interconnector to the Congo River Basin. Lunsemfwa Hydro Power Company and Copperbelt Energy Corporation are two successful IPPs in Zambia, with the later also being an ITC. Most of the SAPP power exchanges take place within the Eastern and Central area shown in more detail in (Figure 12). The Zambian power grid is interconnected to the DRC in the north and Zimbabwe in the south. On-going projects seek to inter connect the country to Tanzania in the northeast, Malawi in the east and Namibia in the west through the Zimbabwe-Zambia- Botswana-Namibia interconnector. Zambia is also a participant in the SAPP Day Ahead Market (previously known as the Short Term Energy Market).

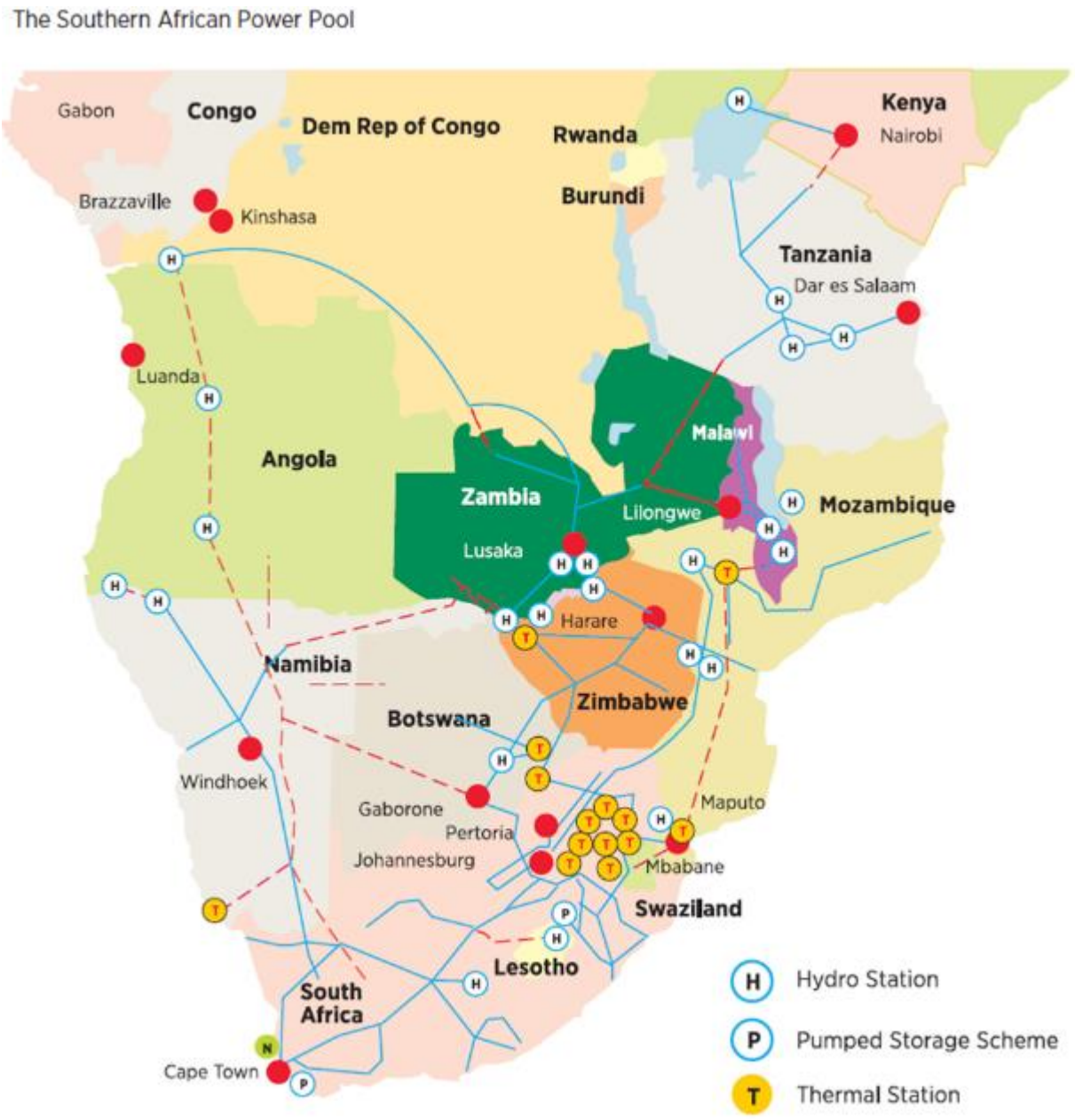

Figure 13: SAPP Interconnectors

3.4.3 Grid Infrastructure

The Zambia National Grid is composed of the main 330 kilovolts (kV) trunk line that spans a total of 2,241 km across the country, from the south where the main hydropower generation stations are located (Kariba North and Kafue dams), to the north in the Copperbelt area where the main load centres are located due to mining activities. The rest of the transmission network is composed of 348 km of 220 kV lines serving as interconnectors with the neighbouring DRC, Namibia and Zimbabwe, 202 km of 132 kV lines and 754 km of 88 kV mainly in the Lusaka area, and 3,033 km of load (figure 13).

3.4.4 Energy Sources at Household Level

According to the 2015 Living Conditions Monitoring Survey (LCMS) Report, the national electricity access rate for Zambia is 31.4% while the access rate for urban and rural areas is reported to be at 67.3% and 4.4 % respectively. Further, the analysis by Residence showed that 7.4 percent of residents in rural areas were using solar panels for lighting purposes.

Figure 13 shows the percentage distribution of households by main type of lighting energy. About 46% of households used a torch as a main source of lighting energy. This was followed by Electricity, used by 31.2% of the households.

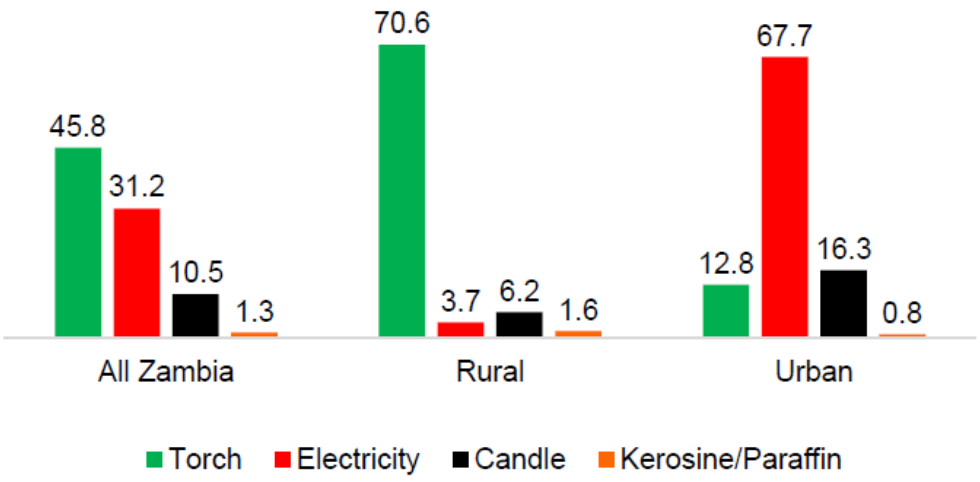

Figure 14: Main Type of Lighting Energy by Rural/Urban, Zambia 2015

Figure 14 shows the percentage distribution of households by main source of energy for cooking and rural/urban. At national level, firewood was the most common source of energy for cooking at 50.7%.

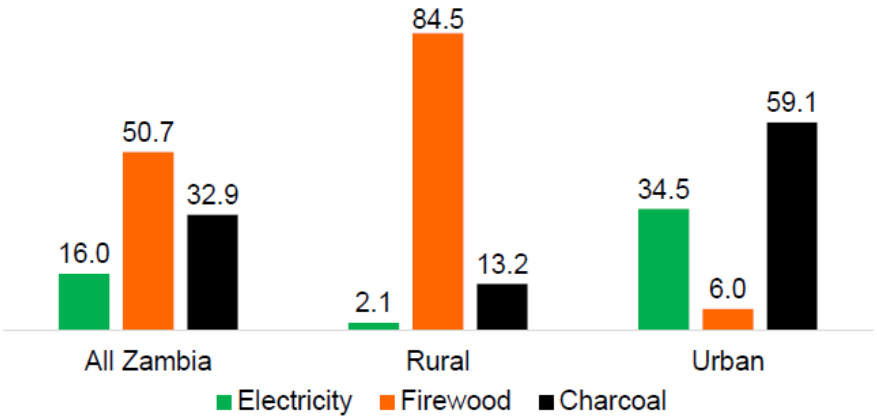

Figure 15: Percentage Distribution of Households by Main Source of Energy for Cooking and Rural/Urban, Zambia, 2015.

Zambia National Grid Network and Regional Interconnectors

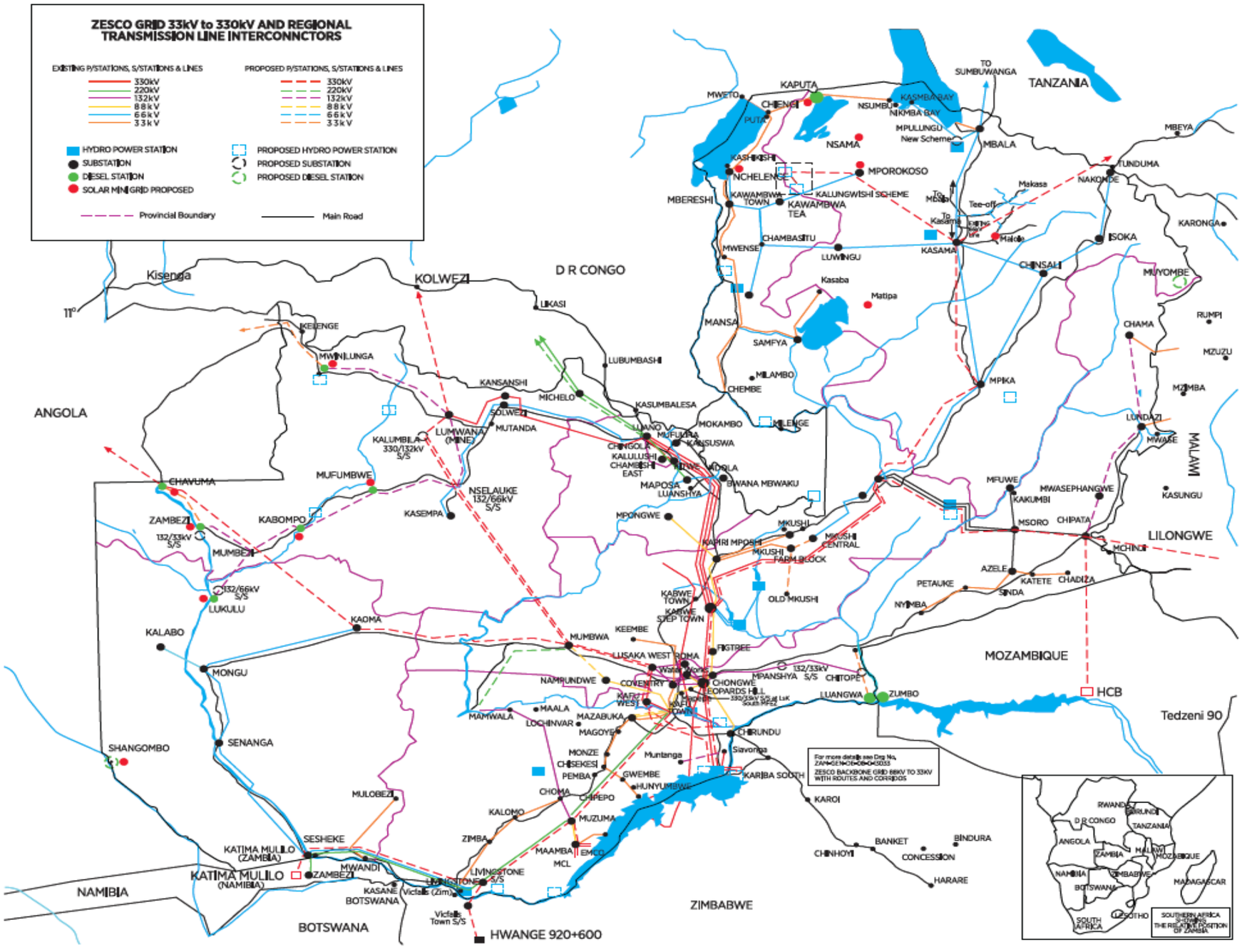

Figure 16: Zambia National Grid Network and Regional Interconnectors

3.4.5 Renewable Energy Zambia

Although Zambia is endowed with new and renewable energy resources, efforts to harness these resources have been minimal. The government recognizes the need for promoting renewable energy and clearly stated its intentions in the National Energy Policy of 2008. The country has potential for the following renewable energies namely;

- **Solar Energy**

  Zambia has an average solar insolation of 5.5 kWh/m^2/day, with approximately 3,000 sunshine hours annually, providing good potential for solar thermal and photovoltaic applications. A preliminary solar energy potential assessment for Zambia was undertaken using Geographic Information System data. Red regions have the highest solar irradiance values up to 2,750 kWh/m2. Zambia's northern areas recorded the highest global solar irradiation of 2,300 kWh/m2/year (Figure 16). The REA has developed a solar mini-grid in Samfya District, Luapula Province. The solar mini-grid project is expected to generate 60 KW of electricity, which will be supplied to a cluster of villages in the Mpata fishing community, which has an estimated total population of 6,000 people and 617 households.

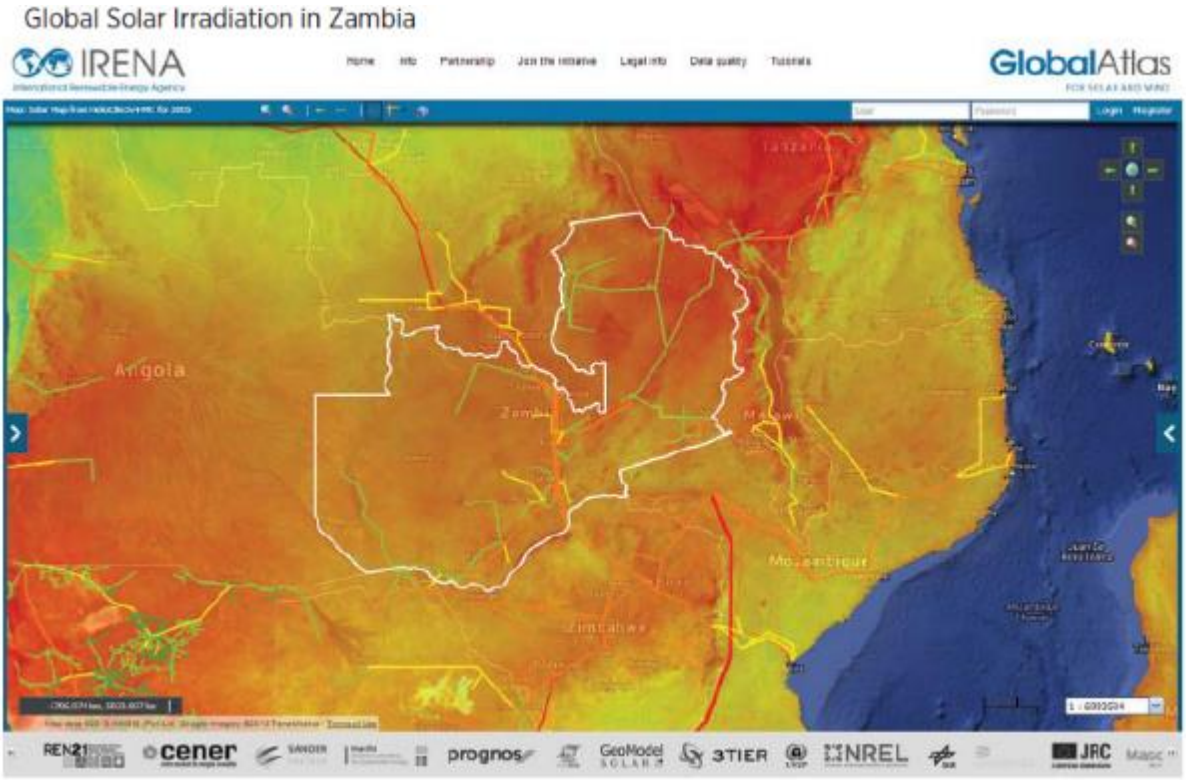

Figure 17: Irradiation in Zambia

- **Wind Energy**

  Wind speeds in Zambia average 3 - 10 m/s above the ground, a speed which is mainly suitable for mechanical applications. Some meteorological data on wind speeds at 10 m above ground is available, but is not adequate to guide investment for power generation. At that height, wind energy is only useful for mechanical energy, such as water pumping. Indications that higher wind speeds may exist at higher heights, e.g., 70 m to 100 m, needs to be explored to direct any strategy to develop wind in Zambia. Encouraging wind hotspots at a higher

altitude were identified from a recent SADC study (2012), the Renewable Energy Strategy and Action Plan, around Chongwe area east of Lusaka (Location: 28° 47' 40" East, 15° 30' 45" South), and along the Muchinga escarpment centered on Chipembele (Location: 31° 28' 57" East, 12° 1' 53" South), which are shown in Figure 17.

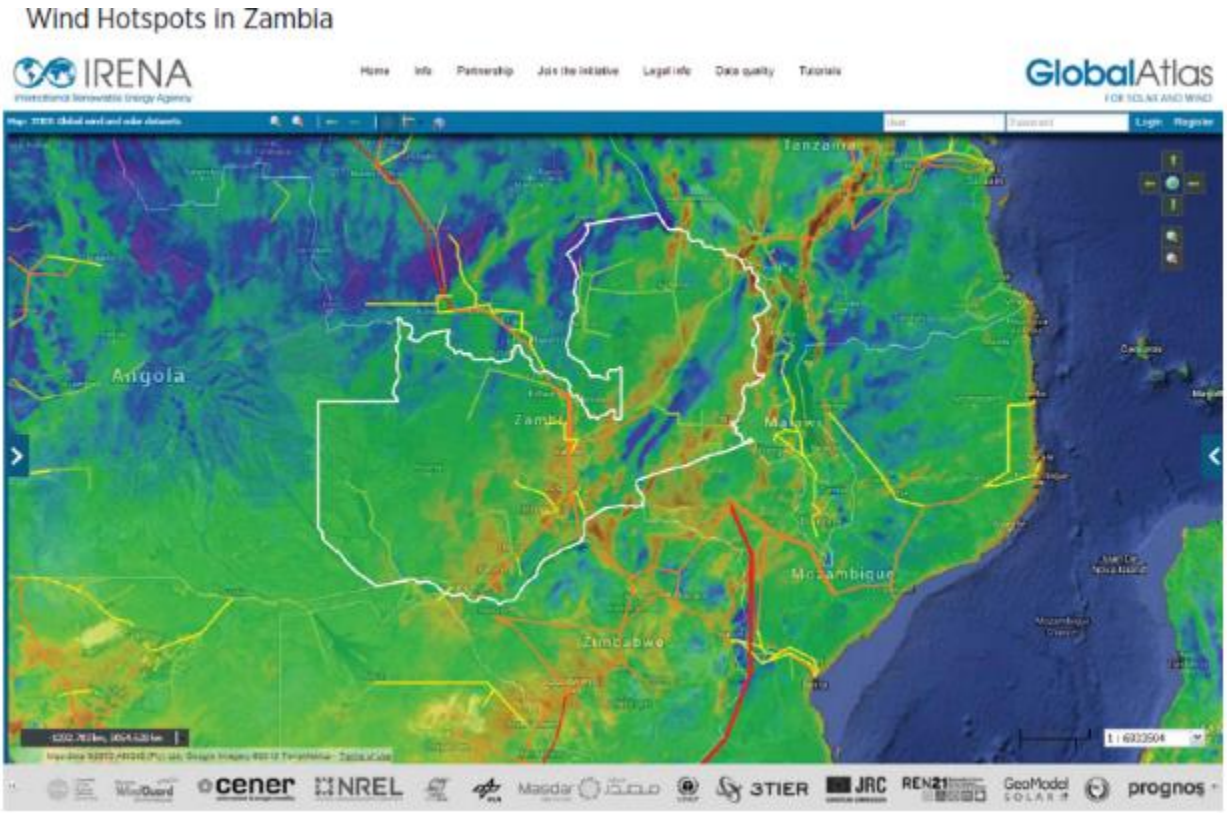

Figure 18: Wind Hotspots in Zambia

3.4.7 Land Tenure and Titling System

The details about land tenure and titling systems are covered in the RPF and therefore only brief descriptions of these issues are included here. Land tenure is the way in which rights in land are held and in Zambia tenure is categorized into two tenure systems namely, statutory tenure and customary. Statutory land tenure refers to state Land which is administered by the Lands Commissioner through local authorities on behalf of the President since all land in the country is vested in the Republican President on behalf of the people. The president of Zambia holds the country's land in perpetuity on behalf of the Zambian people. The president has delegated his powers to make and execute grants and disposition of land to the Commissioner of Lands. The Commissioner has agents who plan the land into plots and thereafter select and recommend suitable candidates to the Commissioner of Lands for issuance of certificate of title. The Commissioner's agents in this regard, are the District, Municipal, and City Councils. These agents use the Town and Country Planning Act to plan the land in their areas in their capacities as planning authorities under the Act. Customary land tenure system applies in areas under the jurisdiction of traditional authorities (chiefs/chieftainesses). The traditional system of tenure is the most prevalent among the majority Zambians who live in rural areas. Approximately 94% of the country is officially designated as customary area. It is occupied by 73 tribes, headed by 240 chiefs, 8 senior chiefs and 4 paramount chiefs. Usually, tenure under customary lands does not allow for exclusive rights in land. No single person can claim to own land as the whole land belongs to the community. Land is deemed as belonging to members of

the community for their own use (Republic of Zambia, 1995). It is a valuable heritage for the whole community. Communal lands in most of the African countries including Zambia have sprung from a concept of ancestral trust committed to the living for their own interest and for the interest of the unborn.

CHAPTER 4: ZAMBIA REGULATORY AND LEGAL FRAMEWORK AND WORLD BANK SAFEGUARD POLICIES

4.1 Introduction

The key institutional actors on the ESAP will include; the MOE, which was responsible for sector policy, planning, and coordination; the Rural Electrification Authority (REA), mandated to administer and manage the Rural Electrification Fund (REF), develop plans for grid and off-grid rural electrification and monitor project implementation, and expand access to electricity in rural areas; the Energy Regulation Board (ERB), with a mandate covering the entire energy sector, and with responsibilities that included licensing, review and approval of power tariffs, and enforcement of quality and service standards; and ZESCO Limited (ZESCO), the national vertically-integrated electricity utility.

During project implementation, environmental and social issues will cut across a wide variety of sectors and there are a number of government institutions and agencies outside of the Zambia Environmental Management Agency (ZEMA), which are involved in aspects of environmental management and these institutions and their legislative responsibilities are summarized in Table 4. Depending on the nature of the ZESAP subprojects and activities, representatives of these institutions may provide technical assistance to the Project Focal persons in the preparation and implementation of subprojects and EIA's, ESMP's and RAP's.

4.2 Overview of Relevant Zambian Policies and Plans

Zambia has over the past two decades developed a number of policies, plans and legislation to guide private and public institutions to pursue environmentally and socially sustainable development agenda in various sectors of the economy. Environmental and social issues are crosscutting and this is reflected in the various legislative frameworks, policies and legal structures that are in place. This subsequent section outlines some of the policies, plans and current legislation in place that are relevant to the proposed project that aims at increasing electricity access in targeted rural areas of Zambia.

The key national policies for renewable energy in Zambia are the National Energy Policy of 2008 (NEP2008), the Seventh National Development Plan (7NDP, 2011 - 2016) and the Vision 2030. As regards the energy sector, the stated ambition is to have universal access to clean, reliable and affordable energy by 2030. In order to increase rural energy access to 51%, the Rural Electrification Master Plan (REMP), a blueprint for rural electrification, was drawn up and is currently being implemented Rural Electrification Authority (REA) with the support of ZESCO. This includes (i) extension of the national grid, (ii) construction of mini-hydro power stations, and (ii) installation of solar home systems.

4.2.1 Vision 2030

Zambia's Vision 2030, completed in 2005, is a long-term planning instrument which reflects the collective understanding, aspirations, and determination of Zambia to become a middle income country. The Vision 2030 was developed in response to a 15 year focus on macroeconomic stability and market liberalization which was useful in stabilizing the economy, but did little to address ingrained poverty and socio-economic development. The Vision 2030 signaled a return to development planning and a focus on poverty reduction in Zambia. In the vision 2030 the

country envisages that Zambians, by 2030, aspire to live in a strong and dynamic middle-income industrial nation that provides opportunities for improving the well-being of all, embodying values of socio-economic justice, underpinned by the principles of:

i. gender responsive sustainable development;
ii. democracy;
iii. respect for human rights;
iv. good traditional and family values;
v. positive attitude towards work;
vi. peaceful coexistence and;
vii. private-public partnerships.

In order to attain the aspiration of vision 2030, the energy sector will be guided by the following principles;

a) Development of appropriate energy technologies and resources to enhance socioeconomic development;
b) Reflect current and future energy supply needs of the country and account for differing energy needs of various users;
c) Develop the human resource for effective implementation of energy programmes;
d) Optimize energy efficiency at the production, transformation and endues levels;
e) Provide incentives to enhance the performance of the energy sector;
f) Integrate energy development into national development interventions and strategies;
g) Sector regulatory autonomy while ensuring efficiency and accountability in regulatory operations;
h) Resource mobilization for development of the energy sector;
i) Partnerships with the private sector, civil society and community groups;
j) Participation of Zambian citizens in all aspects of the energy industry, including ownership structures.

4.2.2 Revised Sixth National Development Plan (2013-2016)

The Revised Sixth National Development Plan (R-SNDP) 2013-2016 is a medium term plan that is primarily aimed at refocusing Government priorities and policies to be in line with the current Government development paradigm. The R-SNDP is primarily an investment plan which focuses on capital investment areas with a bias to rural development and job creation. This approach, therefore, identifies the main growth areas or sectors as Skills Development, Science and Technology, Agriculture, Livestock and Fisheries, Energy, and infrastructural development particularly transport infrastructure while enhancing human development related sectors of Water and Sanitation, Education and Health. The other equally important sectors to stimulate rural development and job creation which are mainly driven by private sector such as Tourism, Manufacturing and Mining will be implemented through the normal recurrent annual budget and Medium Term Expenditure Framework (MTEF). In addition, the Government will also put in place appropriate policy environment for the sectors to thrive. Therefore, the strategic focus of this Plan is to primarily focus on job creation, rural development and promote inclusive growth while investing in human development to take care of macro-economic fundamentals (R-SNDP, 2014).

4.2.3 National Energy Policy (NEP), 2008

The aim of this policy is to create conditions that will ensure the availability of adequate supply of energy from various sources, which are dependable, at the lowest economic, financial, social

and environmental cost consistent with national development goals. The policies in the various energy subsectors are highlighted in the sections that follow. The policy seeks to expand generation and transmission capacity and also increase access to electricity. Consequently the policy measures and strategies to achieve the above objective are highlighted below:

a) Increase generation and transmission capacity for local and regional markets by:
b) Improve accessibility and service delivery to households, Small & Medium Scale Entrepreneurs (SMEs) through:
c) Improve accessibility and service delivery to agriculture, tourism, manufacturing, mining and other commercial activities by:
d) Improve Legislation and institutional framework through:
e) Enhance collaboration between industry, learning and training institutions through:

4.2.4 National Employment and Labour Market Policy, 2006

The National Employment and Labour Market Policy (NELM) addresses measures that relate to the removal of any legal or institutional impediments to the development of a conducive environment for harmonious industrial and labour relations. Further, the policy endeavours to provide a labour market management mechanism that will be able to respond effectively and efficiently to the demands of a liberalized market economy. The labour policy objectives are consistent with the ESAP.

4.2.5 National Agricultural Policy (2016) and Agriculture Sector Investment Plan (2013)

The Second National Agricultural Policy (NAP) seeks to develop an efficient, competitive and sustainable agriculture sector that assures food and nutrition security, increased employment opportunities and incomes. It recognizes the role of the sector in the diversification of the economy and the need for interventions to strengthen the capacity of farmer groups and cooperatives in production, processing, marketing and trade in the areas of crop, livestock and fisheries. It also recognizes the importance and role of the private sector investment and support in agro-processing and marketing. The Zambia National Agriculture Sector Investment Plan (NAIP, 2014-2018) emphasizes the need for diversification and job creation in the agriculture sector. Its overall objective is to facilitate and support the development of a sustainable, dynamic, diversified and competitive agricultural sector that assures food security at household and national levels and maximizes the sector's contribution to GDP. One of the key programmes identified in the plan is market access and services development. The ESAP is complementary to both the NAP and NAIP as it will empower rural communities and households adopt electrical powered tools and farming practices to increase productivity.

4.2.6 The National Decentralisation Policy, 2013

The objectives of Decentralisation in Zambia stems from the need for the citizenry to exercise control over its local affairs and foster meaningful development which requires that some degree of authority is decentralised to provincial, district and sub-district levels as well as Councils, in the background of centralisation of power, authority, resources and functions, which has in turn subjected institutions at provincial, district and sub-district levels to absolute control by the center. In order to remove the absolute control by the center, it is necessary to transfer the authority, functions and responsibilities, with matching resources to lower levels. The vision of Government to achieve a decentralised system within a unitary State in Zambia. In order to achieve the Government's vision in decentralisation and with particular

reference to the ZESEP, one of the policy objectives being pursues relates to empowering provinces, districts and communities in order to achieve effective social economic development.

4.2.7 National Policy on Environmental (NPE), 2005

Zambia's National Environmental Policy is aimed at promotion of sustainable social and economic development through sound management of the environment and natural resources. The policy seeks, among other things, to: secure for all persons now and in the future an environment suitable for their health and well-being; promote efficient utilization and management of the country's natural resources and encourage, where appropriate long - term self-sufficiency in food, fuel wood and other energy requirements; facilitate the restoration, maintenance and enhancement of the ecosystems and ecological processes essential for the functioning of the biosphere and prudent use of renewable resources; integrate sustainable environment and natural resources management into the decentralized governance systems and ensure that the institutional framework for the management of the environment and natural resources supports environmental governance in local government authorities; enhance public education and awareness of various environmental issues and public participation in addressing them; and promote local community, NGO and private sector participation in environment and natural resource management.

The key principles applicable to the ESAP are that:

(1) every person has a right to a clean and healthy environment;
(2) every person has a duty to promote sustainable utilization and management of the environment and natural resources, including taking legal action against any person whose activities or omissions have or are likely to have adverse effects on the environment;
(3) women should effectively participate in policy, program and project design and implementation to enhance their role in natural resource use and management activities;
(4) there is need to use natural resources sustainably to support long-term food security and sustainable economic growth;
(5) rational and secure tenure over land and resources is a fundamental requirement for sustainable natural resource management; and
(6) trade-offs between economic development and environmental degradation can be minimized through use of EIA instruments and environmental monitoring.

For the proposed ESAP it is important to recognize the linkage between environment and development. It is also important to realize that the two are not mutually exclusive, but rather complementary. More important for the component on the project whose key objective is integration and provision of sustainable livelihoods, the project should integrate gender, children and other vulnerable groups' concerns in environmental planning at all levels, to ensure sustainable social and economic development.

4.2.8 National Water Policy, 1994

The National Water Policy of 1994 embraces modern principles of water resources management and endeavors to deal with the challenges of poverty reduction, all aspects of water including resource management, development, and service delivery conforming to the current global and regional trends and the requirements as reflected under the new Sustainable

Development Goals that replace the Millennium Development Goals (MDGs). The overall policy goal is sustainable management and utilization of water resources in order to:

(i) provide water of acceptable quality and of sufficient quantities,
(ii) ensure availability of efficient and effective water and sanitation services that satisfy the basic requirements of every Zambian; and
(iii) enhance the country's natural ecosystems.

One of its objectives is to promote public and private sector participation in water resources management, development, supply and conservation. The principles that will guide the management of water resources include the following:

(i) management, protection and conservation of water resources to be undertaken in an integrated manner;
(ii) all people to have access to potable water and sanitation services to reduce incidences of water related diseases;
(iii) water resources shall be optimally, equitable and rationally allocated and regulated to ensure sustainable optimal economic returns and social enhancement;
(iv) water resources management will be based on the concept of decentralization and will promote local participation with the catchment as the unit of water management;
(v) promote the empowerment of user communities to own, manage and invest in water resources development;
(vi) pollution of water resources shall follow the "Polluter Pays" principle to ensure water user responsibility.

4.2.9 The National Forest Policy of Zambia, 1998

This policy aims at promoting sustainable contribution of national forests, woodlands and trees towards improvement of the quality of life in the country by conserving the resources for the benefit of the nation and to the satisfaction of diverse and changing needs of the Zambian population, particularly rural smallholder farmers and entrepreneurs. The policy prevents changes in land-use, which promote deforestation, constrain farm forestry or endanger the protection of forests with cultural or biodiversity or water catchment conservation values, and it also discourages excisions in gazetted forest, except in cases of environment friendly public utility, for which suitable inter-sectoral and local consultations will be established.

The policy further recognizes environmental impact assessment as an important tool for new projects as one way of promoting sustainable management of forest resources. This will require that activities on the agro business such as the development of small infrastructure comply with EIA regulations to minimize impacts on vegetation and forest cover

4.3 Relevant Zambian Legislation

The table (table 4) below shows an overview of the relevant Zambia legislation, their interpretation and relevance to the ESAP Project.

Table 4: Relevant Zambia Legislation and Interpretation

Legislation	Interpretation of Legislation	Relevance to the Project
Anti-Gender-Based Violence Act, 2010.	An Act to provide for the protection of victims of gender-based violence; constitute the Anti-Gender-Based Violence Committee; establish the Anti-Gender-Based Violence Fund; and provide for matters connected with, or incidental to, the foregoing.	Increased access to electricity in rural areas will result improved economic activities and access to information. This will help vulnerable grouping such as women who are likely to face Gender Based Violence (GBV) to have access to information and also give them economic freedom with increased economic activities.
Disaster Management Act, 2010	An Act to establish and provide for the maintenance and operation of a system for the anticipation, preparedness, prevention, coordination, mitigation and management of disaster situations and the organization of relief and recovery from disasters; establish the National Disaster Management and Mitigation Unit and provide for its powers and functions; provide for the declaration of disasters; establish the National Disaster Relief Trust Fund; provide for the responsibilities and involvement of the members of the public in disaster management; and provide for matters connected with, or incidental to, the foregoing.	Grid extension and the provision of power to rural communities are prone to disasters such as floods that may pose a risk to local communities. The implementing agents on the ESAP will be required to work closely with the Disaster Management and Mitigation Unit (DMMU). The DMMU has been established and mandated to anticipate, prepare and manage disasters should they occur.
Electricity Act, 1995	An Act to regulate the generation, transmission, distribution and supply of electricity; and to provide for matters connected with or incidental to the foregoing	ZESCO and REA will be involved in the generation, transmission, distribution and supply of electricity on the project. This will require that both on and off grid activities are guided by the provision of the Electricity Act.
Employment Act, 1997	An Act to provide legislation relating to the employment of persons; to make provision for the engagement of persons on contracts of service and to provide for the form of and enforcement of contracts of service; to make provision for the appointment of officers of the Labour Department and for the conferring of powers on such officers and upon medical officers; to make provision for the protection of wages of employees; to provide for the control of employment agencies; and to provide for matters incidental to and consequential upon the foregoing.	During project implementation and associated sub projects, various individuals will be engaged to perform multiple tasks. This will require that all contractors on the project adhere to the provision of the employment act and the national labour laws. This will be achieved by creating a conducive work environment, treating workers in a humane manner and remuneration is favorable.

Legislation	Interpretation of Legislation	Relevance to the Project
Energy Regulation Act, 2003	An Act to establish an Energy Regulation Board and to define its functions and powers; to provide for the licensing of undertakings for the production of energy or the production or handling of certain fuels; to repeal the National Energy Council Act and the Zambia Electricity Supply Act; and to provide for matters connected with or incidental to the foregoing	On the ESAP project all licensing of power generation will be undertaken by the Energy Regulation Board (ERB) in line with the provision of the energy regulation act.
Environmental Impact Assessment Regulations, 1997	A developer shall not implement a project for which a project brief or an environmental impact statement is required under these Regulations, unless the project brief or an environmental impact assessment has been concluded in accordance with these Regulations and the Council has issued a decision letter.	The various activates to be undertaken on the project are likely to trigger environmental and social impacts and this will require that site specific environmental instruments be prepared to eliminate or minimize possible impact. At national level, In Zambia the Environmental Impact Assessment (EIA) regulation of 1997 gives guidance, schedules and categories the various project types and the relevant EIA studies to undertaken. It further gives provision on post EIA approval management of projects and guidelines for developing Environmental Social Management Plans (ESMP's) and Resettlement Action Plans (RAP's).
Environmental Management Act, 2011.	An Act to continue the existence of the Environmental Council and re-name it as the Zambia Environmental Management Agency; provide for integrated environmental management and the protection and conservation of the environment and the sustainable management and use of natural resources; provide for the preparation of the State of the Environment Report, environmental management strategies and other plans for environmental management and sustainable development; provide for the conduct of strategic environmental assessments of proposed policies, plans and programmes likely to have an impact on environmental management; provide for the prevention and control of pollution and environmental degradation; provide for public participation in environmental decision making and access to environmental information; establish the Environment Fund; provide for environmental audit and monitoring; facilitate the implementation of international environmental agreements and conventions to which Zambia is a party; repeal and replace the Environmental Protection and Pollution Control Act, 1990; and provide for matters connected with, or incidental to, the foregoing.	Implementation of the ESAP is likely to involve grid extension and reinforcement, connection of power to peri –urban and rural households including medium and small businesses, the installation of off grid installation such as mini hydro's and PV solar panels. This will require that EIA's, ESMP's and RAP's be prepared in accordance with the provisions of the ZEMA EIA regulations were applicable.
Forests Act, 2015	An Act to provide for the establishment and declaration of National Forests, Local Forests, joint forest management areas, botanical reserves, private forests and community forests; provide for the participation of local communities, local authorities, traditional institutions, non-governmental organisations and other stakeholders in sustainable forest management; provide for the conservation and use of forests and trees for the sustainable management of forests ecosystems and biological diversity; establish the Forest Development Fund; provide for the implementation of the United Nations Framework Convention on Climate Change,	The ESAP project will involve both linear and site specific activities and these are likely to result in the clearing of vegetation to pave way for installation. During project implementation, earth works and the clearance of vegetation will be restricted to the project footprint to minimized the loss of vegetation cover.

Legislation	Interpretation of Legislation	Relevance to the Project
	Convention on International Trade in Endangered Species of Wild Flora and Fauna, the Convention on Wetlands of International Importance, especially as Water Fowl Habitat, the Convention on Biological Diversity, the Convention to Combat Desertification in those Countries experiencing Serious Drought and/or Desertification, particularly in Africa and any other relevant international agreement to which Zambia is a party; repeal and replace the Forests Act, 1999; and provide for matters connected with, or incidental to, the foregoing.	
Gender Equity and Equality Act, 2015	An Act to establish the Gender Equity and Equality Commission and provide for its functions and powers; provide for the taking of measures and making of strategic decisions in all spheres of life in order to ensure gender equity, equality and integration of both sexes in society; promote gender equity and equality as a cross cutting issue in all spheres of life and stimulate productive resources and development opportunities for both sexes; prohibit harassment, victimisation and harmful social, cultural and religious practices; provide for public awareness and training on issues of gender equity and equality; provide for the elimination of all forms of discrimination against women, empower women and achieve gender equity and equality by giving effect to the Convention on the Elimination of all Forms of Discrimination against Women, the Protocol to the African Charter on Human and People's Rights on the Rights of Women in Africa and the SADC Protocol on Gender and Development; and provide for matters connected with, or incidental to, the foregoing.	The project will mainstream gender equality into its project activities to help groupings such as women and children that are marginalized, are more susceptible to climate change, economic shocks and environmental – social risks be more resilient.
Human Rights Commission Act, 1996	An Act to provide for the functions and powers of the Human Rights Commission; to provide for its composition and to provide for matters connected with or incidental to the foregoing.	The proposed ESAP will increase access to electricity, business opportunities and information. This will ensure beneficiaries have increased opportunities and are able to make informed decisions to in order to like improve their welfare and live a dignified life.
Lands Act, 1964	An Act to provide for the continuation of leaseholds and leasehold tenure; to provide for the continued vesting of land in the President and alienation of land by the President; to provide for the statutory recognition and continuation of customary tenure; to provide for the conversion of customary tenure into leasehold tenure; to establish a Land Development Fund and a Lands Tribunal; to repeal the Land (Conversion of Titles) Act; to repeal the Zambia (State Lands and Reserves) Orders, 1928 to 1964, the Zambia (Trust Land) Orders, 1947 to 1964, the Zambia (Gwembe District) Orders, 1959 to 1964, and the Western Province (Land and Miscellaneous Provisions) Act, 1970; and to provide for matters connected with or incidental to the foregoing.	Implementation of the ESAP is likely to involve grid extension and reinforcement, connection of power to peri –urban and rural households including medium and small businesses, the installation of off grid installation such as mini hydro's and PV solar panels. This will require that the provisions on the lands act are taken into consideration with regard to titling and land tenure.
Local Government Act, 1995	An Act to provide for an integrated three tier local administration system; to define the functions of local authorities; to repeal the Local Administration Act and certain related laws; and to provide for matters connected with or incidental to the foregoing.	Project implementation and supervision will require the support of local authorities country wide as they have strong links with the grassroots and communities in their jurisdiction. The function of the local

Legislation	Interpretation of Legislation	Relevance to the Project
		authorities are guided by the provision of the Local Government Act. The project will also support the drive by central Government to decentralize responsibilities to municipalities.
National Heritage Conservation Commission Act, 1989	An Act to repeal and replace the Natural and Historical Monuments and Relics Act; to establish the National Heritage Conservation Commission; to define the functions and powers of the Commission; to provide for the conservation of ancient, cultural and natural heritage, relics and other objects of aesthetic, historical, prehistorical, archaeological or scientific interest; to provide for the regulation of archaeological excavations and export of relics; and to provide for matters connected with or incidental to the foregoing.	The project will develop a chance finds procedure to guide contractors on reporting channels and processes. The National Heritage and Conservation Commission NHCC) will be notified should a chance find be cited and offer guidance on how such sensitive findings should be handled.
Occupational Health and Safety Act, 2010	An Act to establish the Occupational Health and Safety Institute and provide for its functions; provide for the establishment of health and safety committees at workplaces and for the health, safety and welfare of persons at work; provide for the duties of manufacturers, importers and suppliers of articles, devices, items and substances for use at work; provide for the protection of persons, other than persons at work, against risks to health or safety arising from, or in connection with, the activities of persons at work; and provide for matters connected with, or incidental to, the foregoing.	During the implementation of project activities, personnel involved in construction of infrastructure and their operation will be required to adhere to best practices with regards to Occupational Health and Safety. Procedures and manuals and regular onsite training will be undertaken to ensure personnel working on site are conversant with the information contained. The project will ensure that high risk areas are clearly marked with restricted access and the provision of the relevant Personal Protective Equipment (PPE) will be mandatory.
Public Health Act, 1995	An Act to provide for the prevention and suppression of diseases and generally to regulate all matters of public health in Zambia.	During project implementation, all activities will incorporate measures that prevent and minimize the spread of diseases in order to protect the health of the general public.
Public Procurement Act, 2008	An Act to continue the existence of the Zambia National Tender Board and re-name it as the Zambia Public Procurement Authority; revise the law relating to procurement So as to ensure transparency and accountability in public procurement; regulate and control practices relating to public procurement in order to promote the integrity of, fairness and public confidence in, the procurement process; repeal and replace the Zambia National Tender Board Act, 1982; and provide for matters connected with or incidental to the foregoing	The project will involve the procurement of works, goods and services and this will require that the process follow the Zambia Public Procurement Authority (ZPPA) guidelines to ensure fairness, transparency, integrity, accountability and promote public and stakeholder confidence. The process will be further complimented by World Bank procurement polices

Legislation	Interpretation of Legislation	Relevance to the Project
Roads and Road Traffic Act, 1995	An Act to make provision for the care, maintenance and construction of roads in Zambia, for the control of motor traffic, for the licensing of drivers and motor vehicles, for the compulsory third party insurance of motor vehicles, for the licensing and control of public service vehicles and public services, and for other miscellaneous provisions relating to roads and motor traffic.	During implementation of project activities, they is likely to be disruption to roads and traffic in surrounding areas. This will be during construction activities requiring earthworks in close proximity to roads and delivery of materials. Constructors will be required to adhere to set speed limits, undertake works and bulk deliveries away from off pick time and work within the project footprint to minimize intrusion into surrounding areas.
Rural Electrification Act, 2003	An Act to establish the Rural Electrification Authority (REA) and to define its functions; to establish the Rural Electrification Fund; and to provide for matters connected with or incidental to the foregoing.	The REA is mandated with the tasks of Administering and managing the Rural Electrification Fund (REF); developing and implementing the REMP, mobilizing funds to support rural electrification, encouraging private sector participation in rural electrification through provision of smart subsides, competitive bidding and community mobilization, financing project preparation studies for rural electrification and recommending to government suitable policies. Of critical importance to REA is the identification of various technologies that can be tapped to improve the standard of living of our rural population. The REA promotes renewable energy resources such as solar, mini hydros and biomass. Solar energy technology is being considered in some rural areas which will not benefit from extension of the national grid and mini hydro potential in the immediate future.
Urban and Regional Planning Act, 2015	An Act to provide for development, planning and administration principles, standards and requirements for urban and regional planning processes and systems; provide for a framework for administering and managing urban and regional planning; provide for a planning framework, guidelines, systems and processes for urban and regional planning; establish a democratic, accountable, transparent, participatory and inclusive process for urban and regional planning that allows for involvement of communities, private sector, interest groups and other stakeholders in the planning, implementation and operation of human settlement development; ensure functional efficiency and socio-economic integration by providing for integration of activities, uses and facilities; establish procedures for integrated urban and regional planning in a devolved system of governance so as to ensure multi-sector cooperation, coordination and involvement of different levels of ministries,	Project implementation is likely to involve construction activities. These activities are likely to alter the landscape of the current layout of target areas. The project in collaboration with the local authorities in which these areas fall will ensure the designs and plans adhere with the Urban and Regional Planning of the areas so as to be in harmony with the councils' expansion master plan.

Legislation	Interpretation of Legislation	Relevance to the Project
	provincial administration, local authorities, traditional leaders and other stakeholders in urban and regional planning; ensure sustainable urban and rural development by promoting environmental, social and economic sustainability in development initiatives and controls at all levels of urban and regional planning; ensure uniformity of law and policy with respect to urban and regional planning; repeal the Town and Country Planning Act, 1962, and the Housing (Statutory and Improvement Areas) Act, 1975; and provide for matters connected with, or incidental to, the foregoing.	
Water Act, 1964	An Act to consolidate and amend the law in respect of the ownership, control and use of water; and to provide for matters incidental thereto or connected therewith.	The abstraction or use of water during construction and operational activities will be required to be done in a sustainable manner. This will reduce or eliminate incidences of infringing on the rights of other water users to access the resource.
Water Resources Management Act, 2011	An Act to establish the Water Resources Management Authority and define its functions and powers; provide for the management, development, conservation, protection and preservation of the water resource and its ecosystems; provide for the equitable, reasonable and sustainable utilisation of the water resource; ensure the right to draw or take water for domestic and non-commercial purposes, and that the poor and vulnerable members of the society have an adequate and sustainable source of water free from any charges; create an enabling environment for adaptation to climate change; provide for the constitution, functions and composition of catchment councils, sub-catchment councils and water users associations; provide for international and regional co-operation in, and equitable and sustainable utilisation of, shared water resources; provide for the domestication and implementation of the basic principles and rules of international law relating to the environment and shared water resources as specified in the treaties, conventions and agreements to which Zambia is a State Party; repeal and replace the Water Act, 1949; and provide for matters connected with, or incidental to, the foregoing.	During the implementation of the ESAP any activities that are likely to affect water resources will be required to comply with the provision of the water resources will ensure that water resources and ecosystems are protected.
Zambia Wildlife Act, 2015	An Act to governing the affairs of the Zambia Wildlife Authority; establish the Department of National Parks and Wildlife in the Ministry responsible for tourism; provide for the establishment, control and management of National Parks, bird and wildlife sanctuaries and for the conservation and enhancement of wildlife eco-systems, biological diversity and objects of aesthetic, pre-historic, historical, geological, archeological and scientific interest in National Parks; provide for the promotion of opportunities for the equitable and sustainable use of the special qualities of public wildlife estates; provide for the establishment, control and co-management of Community Partnership Parks for the conservation and restoration of ecological structures for non-consumptive forms of recreation and environmental education; provide for the sustainable use of wildlife and the effective management of the wildlife habitat in Game Management Areas; enhance the benefits of Game Management	The construction, activities on the project may affect flora and fauna in the area. The project will ensure that all personnel on site undergo orientation on how to handle the siting of wild species in ecologically sensitive areas.

Legislation	Interpretation of Legislation	Relevance to the Project
	Areas to local communities and wildlife; involve local communities in the management of Game Management Areas; provide for the development and implementation of management plans; provide for the regulation of game ranching; provide for the licensing of hunting and control of the processing, sale, import and export of wild animals and trophies; provide for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on Wetlands of International Importance especially as Waterfowl Habitat, the Convention on Biological Diversity, the Lusaka Agreement on Cooperative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora and other international instruments to which Zambia is party; repeal the Zambia Wildlife Act, 1998; and provide for matters connected with, or incidental to, the foregoing.	

4.4 World Bank Safeguard Policies Overview

As a key financing institution, the World Bank is committed to supporting developmental projects, while eliminating or minimizing any adverse impacts or risks on the environment, society and human health. These impacts can be severe or moderate, localized or regional, short or long term. In order to minimize and manage environmental and social impacts, the Bank's operational policies are triggered and the environmental assessment (EA) is key process of the Bank due diligence. These safeguards provide a mechanism and tools for ensuring integration of environmental concerns and social issues into the planning and implementation of development projects financed by the Bank.

The Bank has a total of ten safeguard policies which can be triggered depending on the nature and complexity of the proposed projects or sub-projects. In the context of the proposed mining remediation and improvement project, and the associated sub-project four (4) of the ten (10) safeguard policies have been triggered. The table below shows the World Bank safeguard polices that have been triggered to mitigate possible impacts during the project and in associated sub-projects.

Table 5: World Bank Safeguards Polices and their relevance to ESAP

Safeguard Policies	Triggered	Relevance of World Bank Safeguards polices to the Electricity Supply Access Project and associated sub-projects
Environmental Assessment OP/BP 4.01 including Environmental Health and Safety Guidelines	Yes	The Policy on Environmental Assessment has been triggered as component A and B of the project will involve infrastructure and construction related activities for both on-grid and off-grid power connectivity. The project will broadly involve, grid extension and intensification, subsidized connections to low-income rural customers under a similar results-based approach as used under the IAES and GPOBA funded projects. The project will further support a loan facility to support electrification of rural communities through private sector lead mini-grid developments and commercial sale of stand-alone systems. Since specific sites and beneficiary communities have not been defined, The Ministry of Energy, Rural Electrification Authority (REA) and Zambia Electricity Supply Corporation (ZESCO) have developed an ESMF and RPF that addresses the environmental and social risks associated with the implementation of the electricity service access project. Once the specific sites and the beneficiary communities have been defined, all projects subprojects and activities will be screened the appropriate EISA's, EMSP's and RAP will be developed were applicable with the provisions of the ZEMA EIA regulations and Bank safeguards policies. In addition, the World Bank Group Environmental, Health and Safety Guidelines are applicable to the project, with the following specific guidelines to be adopted and utilized by the contractors and other project implementers: general, occupational health and safety, community health and safety, waste management facilities.[20]
Natural Habitats OP/BP 4.04	Yes	The policy on natural habitats has been triggered as the project will involve linear activities such grid extension and intensification that are likely transverse ecologically sensitive areas and natural habitats.
Forests OP/BP 4.36	Yes	The policy has been triggered as linear activities such as grid extension and reinforcement, construction of off grid facilities and installation may require vegetation clearance. The extent of vegetation loss is however minimal as construction activities will be restricted to the way leave and project footprint.
Pest Management OP 4.09	No	The policy on pest management has not been triggered as it will not involve the use or support activities that require the application of pesticides.
Physical Cultural Resources OP/BP 4.11	No	The policy on physical cultural resources has not been triggered as the project will involve works in cultural sensitive areas. During construction works, the ESMF and the ESIA will incorporate a chance find procedure should artefacts of heritage or historical significance be unearthed.
Indigenous Peoples OP/BP 4.10	No	The policy is not been triggered since the project areas do not have indigenous people as defined by Bank Policy
Involuntary Resettlement OP/BP 4.12	Yes	No physical displacement is anticipated due to the nature of the project. However, the project through Component B Network Reinforcement may require some land for the stations/poles and/or low voltage distribution line and may involve small land acquisition for mini-grids, and limited change in land use (permanent or temporary). OP/BP 4.12 is therefore triggered to address the adverse

[20] World Bank Group EHS Guidelines:
http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/our+approach/risk+management/ehsguidelines

Safeguard Policies	Triggered	Relevance of World Bank Safeguards polices to the Electricity Supply Access Project and associated sub-projects
		impacts of the potential land acquisition and limited changes in land use, which may cause losses of assets. As the specific subprojects are not yet clearly defined and the exact sites of the proposed investments are not yet known, an RPF has been developed and submitted to the Bank for clearance by the Ministry of Energy to address issues relating to relocation, encroachments and compensation
Safety of Dams OP/BP 4.37	No	The policy is not triggered as it will not involve the construction or maintenance of dams as defined by the Bank policy
Projects on International Waterways OP/BP 7.50	No	The policy is not triggered as it will not affect international waterways.
Projects in Disputed Areas OP/BP 7.60	No	The policy is not triggered as no disputed areas have been identified.

4.5 Complementarity and gaps between Zambian Legislation and World Bank Safeguard Policies

A comparison between Zambian legislation and the operational safeguard policies the World Bank reveals no significant differences or gaps. There are more similarities than there are differences. The two sets of policies and legislation recognize the importance of environmental and social benchmarks in order to mainstream environmental and social issues in development project, and will play a complementary role in the project.

Table 6: World Bank Safeguards and complementary to Zambian Legislation

World Bank Safeguards Polices		Zambian Legislation
Environmental	• Environmental Assessment OP/BP 4.01 (including Environmental Health and Safety Guidelines) • Natural Habitats OP/BP 4.04 • Forests OP/BP 4.36	• Disaster Management Act, 2010 • Electricity Act, 1995 • Energy Regulation Act, 2003 • Environmental Impact Assessment Regulations, 1997 • Environmental Management Act, 2011. • Forests Act, 2015 • Lands Act, 1964 • Local Government Act, 1995 • National Heritage Conservation Commission Act, 1989 • Occupational Health and Safety Act, 2010 • Roads and Road Traffic Act, 1995 • Rural Electrification Act, • 2003 • Urban and Regional Planning Act, 2015 • Water Act, 1964 • Water Resources Management Act, 2011 • Zambia Wildlife Act, 2015
Social	• Involuntary Resettlement OP/BP 4.12	• Anti-Gender-Based Violence Act, 2010. • Disaster Management Act, 2010 • Employment Act, 1997 • Environmental Impact Assessment Regulations, 1997 • Environmental Management Act, 2011. • Forests Act, 2015 • Lands Act, 1964 • Local Government Act, 1995 • National Heritage Conservation Commission Act, 1989 • Occupational Health and Safety Act, 2010 • Public Health Act, 1995 • Public Procurement Act, 2008 • Roads and Road Traffic Act, 1995 • Rural Electrification Act, • 2003 • Urban and Regional Planning Act, 2015 • Water Act, 1964 • Water Resources Management Act, 2011 • Zambia Wildlife Act, 2015

They are various Zambia legislations that compliment world bank safeguards polices on both social and environment. Furthermore, acts like the Occupational Health and Safety Act are supplemented by the World Bank environment, health and safety guidelines. The Environmental Management Act (EMA), 2011 and the EIA Regulations, 1997 remains the anchor legislation that considers both the environmental and social risks on projects. Gaps however exist with regard to categorization of projects, examples are projects that fall in the second schedule of the EIA regulation that are considered high risk but are category B on Bank funded projects, the opposite is also true. This can however be overcome by consultations before undertaking EIA studies between the PIU's, Bank team and ZEMA to identify the instruments and categorization that meet satisfy the requirements of all stakeholders. The ESMF is however, not a national requirement in Zambia but is shared with ZEMA for their planning and records. In situations where a subproject or activity does not require a safeguards instrument as in the first and second schedule of the EIA regulation in Zambia, an ESMP will be prepared, as a minimum, to ensure that any safeguard issues are addressed. Furthermore, the more stringent approach will be applied in situation were gaps are noted.

CHAPTER 5: LISTING OF POTENTIAL IMPACT AND MITIGATION MEASURES

5.1 Impact Identification, and Mitigation measures

During the implementation of the ESAP, different types of sub-projects will be prepared and delivered in the Project's outreach activities and initial target areas will cover rural areas. These sub-projects will have different types of negative environmental and social impacts associated with them. In this chapter the ESMF identifies possible impacts and mitigation measures that will be incorporated into an ESMP during project implementation. This ESMF will form part of the tender documents for construction works. An ESMP for construction will be prepared by the Contractor and approved by the [Supervising Engineer or PIU] prior to start of works. The ESMP will incorporate the relevant aspects of the WBG Environmental, Health and Safety Guidelines (General Guideline and relevant electricity supply access project)[21] Issues related to involuntary resettlement and compensation that may arise as a direct consequence of the sub-projects are dealt with separately in the Resettlement Policy Framework (RPF).

Implementation of the contracts for both on-grid and off-grid components may require contractors to mobilize skilled and unskilled labor to project sites and to establish labor and resource supply camps, thus resulting in labor influx into beneficiary communities. While the numbers of outside workers expected to be needed for such installations, especially for the off-grid sites is expected to be small, bringing in outside workers and setting up temporary work camps could create some social risk to local communities. The Project will take appropriate measures to prevent and address potential negative consequences by incorporating obligations in contracts, working with local governments, public employees, and relevant CBOs and NGOs familiar with these issues; adopting and enforcing a code of conduct for the workers and educating them as well as the affected communities on proper conduct; building capacity among contractors, ZESCO, REA and private providers of off-grid electricity access services to address these issues; and rigorously monitoring these issues and reporting on them among others.

5.2 Environmental and Social Impacts

The proposed sub projects are in two broad categories namely on and off grid project activities that are likely to result into both negative and positive environmental and social risks/impacts. The table below (Table 6) presents a summary of the social impacts and mitigation or enhancement measures that are relevant to the interventions under the project.

[21] http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/our+approach/risk+management/ehsguidelines

Table 7: Identification of Risks Impacts and Mitigation measures of planned subprojects

PROJECT COMPONENT	PROJECT	RISK/IMPACT	MITIGATION MEASURES	RESPONSIBILITY	ACCOUNTABLE
ON-GRID ELECTRICITY ACCESS					
Component 1: On-grid Electricity Access	• Grid extension and intensification; • Subsidized connection to low-income rural communities •	Creation of employment and business opportunities for local communities	During project implementation, priority for employment and business opportunities will be given to the local communities	REA, ZESCO and Contractors	REA and ZESCO
		Increased access to a reliable power source and Increased productivity.	REA and ZESCO will ensure that beneficiary communities to be connected to the power grind in the rural and peri- urban and rural areas are selected based priority and economic considerations.	REA and ZESCO	REA and ZESCO
		Generation and poor disposal of construction waste during works	Waste and debris, including sediments and vegetation shall be managed and kept in temporary controlled area and transported in a secure manner for disposal in appropriate disposal facility.	Contractors Site supervisor	Construction Company
		Loss of Vegetation cover	The Construction footprint will be	Project Manager, Contractors Site	Construction Company

PROJECT COMPONENT	PROJECT	RISK/IMPACT	MITIGATION MEASURES	RESPONSIBILITY	ACCOUNTABLE
			restricted to the site design and loss of vegetation will be kept to a minimum. Furthermore, Construction workers will be sensitized on the natural physical-chemical and biological environment around the project site.	supervisor and Contractors Site Safety Officers	
		Potential increased exposure from generation of dust and noise pollution due to operation of different types of equipment and machinery	Dust suppression measures will be undertaken and construction and use of machinery will be restricted to normal working hours and will meet regulatory requirements There will be no excessive idling of construction vehicles at sites. There will be no open burning of construction / waste material at the site.	Contractors Site supervisor	Construction Company
		Contamination of soils by hydrocarbon fuels and lubricants	All fuels and lubricants will be stored in bunded sheds to minimize	Contractors Site supervisor, REA and ZESCO	Construction Company, REA and ZESCO

PROJECT COMPONENT	PROJECT	RISK/IMPACT	MITIGATION MEASURES	RESPONSIBILITY	ACCOUNTABLE
			spillages and soil contamination		
		Safety and security of community during construction works	The construction areas will be properly secured with signposting, warning signs, barriers and traffic diversions. Signage should inform the public of potential hazards. Provision of safe passages and crossings for pedestrians, along with active traffic management. Adjustment of working hours to prevent disruption of pedestrian access and local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement Community to be informed about possible temporary restrictions to access. On the job training of workers and provision	Contractors Site Safety Officers	Construction Company and Security company

PROJECT COMPONENT	PROJECT	RISK/IMPACT	MITIGATION MEASURES	RESPONSIBILITY	ACCOUNTABLE
			of appropriate PPE by contractors.		
		Increase incidences of HIV/AIDS and sexually Transmitted infections	Workers and community members to be sensitized on the dangers posed by HIV/AIDS or other STCs as well as the means of prevention.	Contractors Site Safety Officers	Construction Company
		Poor living conditions and sanitation workers	If labor camps need to be set up, proper water supply and waste management systems should be provided.	Project Manager, Contractors Site supervisor and Contractors Site Safety Officers	Construction Company, REA and ZESCO
		Visual intrusion and changes to the landscape	Site Selection will take into consideration current land use to ensure proposed activities do not alter the aesthetics and general landscape.	Project Manager, Community Leaders and Local Authorities	Project Manager and Site Community Leader
OFF-GRID ELECTRICITY ACCESS EXPANSION					
Component 2: Off-grid Electricity Access Expansion	• A subsidy scheme to support electrification of rural communities through private	Creation of employment and business opportunities for local communities	During project implementation employment and business opportunities	REA and Private Developer	REA and Private developer

PROJECT COMPONENT	PROJECT	RISK/IMPACT	MITIGATION MEASURES	RESPONSIBILITY	ACCOUNTABLE
	sector-led mini-grid developments; • A loan facility to support electrification of rural communities through private sector lead mini-grid developments and commercial sale of stand-alone systems.		will be given to the local communities		
		Increased access to a reliable power source and Increased productivity.	REA and ZESCO will ensure that beneficiary communities to be connected to the power grind in the rural areas are selected based priority and economic considerations.	REA	REA
PV Solar Installation					
		Risks and Impacts associated with the Installation of PV Solar panels • Contribution of clean energy and supply of power to the beneficiaries, reducing the	During project implementation, non-reflective PV solar panels will be adopted and installed to reduce visual intrusion.	REA and Private Developer	REA and Private Developer

PROJECT COMPONENT	PROJECT	RISK/IMPACT	MITIGATION MEASURES	RESPONSIBILITY	ACCOUNTABLE
		pressure on the existing electricity grid in terms of demand • Promotion of PV technology development • Potential visual impact of the solar panels • Introduction of light sources on the top of the buildings • Disposal of obsolete PV panels and batteries	Disposal of PV solar panels will be done with the support of the suppliers and their decommissioning guidelines. Used batteries will be collected and recycled at ZEMA approved recycling centers.		
Mini Hydro's					
		Risks and impacts of developing a Mini Hydro power station The construction and operation of mini hydro power station are likely to result in; • Increased access to electrical power to communities that are not connected to the national grid. • Impacts on downstream and upstream river flowrates, ecological	During project implementation mini hydro's designs will ensure; • They maximize the hydro potential of selected rivers and streams. • Environmental and ecological consideration will ensure designs do not alter the flow rates of selected rivers and streams	REA and Private Developer	REA and Private Developer

PROJECT COMPONENT	PROJECT	RISK/IMPACT	MITIGATION MEASURES	RESPONSIBILITY	ACCOUNTABLE
		and environmental flows • Increased incidences of flooding in	• Site selection will ensure that risks associated with flooding during the rainy season do not affect the community.		
Rural Electrification					
		Generation and poor disposal of construction waste during works	Waste and debris, including sediments and vegetation shall be managed and kept in temporary controlled area and transported in a secure manner for disposal in appropriate disposal facility.	Private developer Site supervisor	Private developer
		Loss of Vegetation cover	The Construction footprint will be restricted to the site design and loss of vegetation will be kept to a minimum. Furthermore, Construction workers will be sensitized on the natural physical-chemical and biological	Project Manager, Private developer Site supervisor and Private developer Site Safety Officers	Private developer

PROJECT COMPONENT	PROJECT	RISK/IMPACT	MITIGATION MEASURES	RESPONSIBILITY	ACCOUNTABLE
			environment around the project site.		
		Potential increased exposure from generation of dust and noise pollution due to operation of different types of equipment and machinery	Dust suppression measures will be undertaken and construction and use of machinery will be restricted to normal working hours and will meet regulatory requirements . There will be no excessive idling of construction vehicles at sites. There will be no open burning of construction / waste material at the site.	Private developer Site supervisor	Private developer
		Contamination of soils by hydrocarbon fuels and lubricants	All fuels and lubricants will be stored in bunded sheds to minimize spillages and soil contamination	Private developer Site supervisor and REA	REA and Private Developer
		Safety and security of community during construction works	The construction areas will be properly secured with signposting, warning signs, barriers and traffic diversions. Signage should inform	Private developer Site Safety Officers	Private Developer

PROJECT COMPONENT	PROJECT	RISK/IMPACT	MITIGATION MEASURES	RESPONSIBILITY	ACCOUNTABLE
			the public of potential hazards. Provision of safe passages and crossings for pedestrians, along with active traffic management. Adjustment of working hours to prevent disruption of pedestrian access and local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement Community to be informed about possible temporary restrictions to access. On the job training of workers and provision of appropriate PPE by contractors.		
		Increase incidences of HIV/AIDS and sexually Transmitted infections	Workers and community members to be sensitized on the dangers posed by HIV/AIDS or other	Private Developer Site Safety Officers	Private Developer

PROJECT COMPONENT	PROJECT	RISK/IMPACT	MITIGATION MEASURES	RESPONSIBILITY	ACCOUNTABLE
			STCs as well as the means of prevention.		
		Poor living conditions and sanitation workers	If labor camps need to be set up, proper water supply and waste management systems should be provided.	Project Manager, Private Developer Site supervisor and Private Developer Site Safety Officers	Construction Company and PIU
		Visual intrusion and changes to the landscape	Site Selection will take into consideration current land use to ensure proposed activities do not alter the aesthetics and general landscape.	Project Manager, Community Leaders and Local Authorities	Project Manager and Site Community Leader

CHAPTER 6: CLASSIFICATION OF SUB-PROJECTS, SCREEENING APPROVAL AND IMPLEMENTATION

6.1 Subproject Preparation and Approval

The identification of sub-projects will be done based on commercial viability, socio-economic needs, hydro and solar potential. The following is an outline of the process that will be undertaken to oversee the subproject identification, preparation, screening, approval and implementation process for both grid and off grid infrastructural and construction activities. The process will be guided by the Environmental Management Act, EIA regulations and World Bank safeguard policies in order to address environmental and social management considerations under the project.

6.2 Environmental and Social Screening

This section outlines the stages of the environmental and social screening process (the screening process) leading towards the review and environmental approval of any sub-project that will be undertaken on the ESAP. To facilitate environmental and social screening, the ESMF has provided a checklist for subproject screening that will assist stakeholders, proponents and project staff with the identification of environmental and social issues relating to the subproject location and the surrounding environment based on available knowledge and field investigations. The subproject proponents for component A (on-grid) is ZESCO, for sub-Component B1 and sub-Component B2 it is the private partner. Once a subproject/subcomponent is specified for a particular location, ZESCO, REA or DBZ will complete the environmental and social checklist for their respective subprojects and activities. In some instances, a field appraisal may be required depending on the information in the environmental and social checklist (Annex 1).

6.2.1 Environmental Screening

This initial screening will be carried out through the use of the Environmental and Social Screening Form. For Component A, the screening will be carried out by the PIU's safeguard staff at ZESCO. For sub-Component B1, the screening will be carried out by the PIU's safeguard staff at REA. For sub-Component B2, the screening will be carried out by the safeguard staff at DBZ. For Component A and B2 REA through its Safeguards Team in the PIU will confirm ZESCO's and DBZ's screening. . Completion of this screening form will facilitate the identification of potential environmental and social impacts, determination of their significance, assignment of the appropriate environmental category, proposal of appropriate mitigation measures, and conduct any further work, if necessary.

6.2.2 Assigning the Environmental Categories and preparing appropriate instruments

The assignment of the appropriate environmental category will be based on the World Bank safeguard policy categorization and on the provisions of the ZEMA EIA Regulation project schedule, depending on type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. Field appraisals will be required for category B sub-projects and other projects which are deemed to have moderate to significant impacts.

A generic Environmental and Social Management Plan (ESMP) that addresses impacts at all the stages of a sub project cycle (design, implementation and operational phases) is annexed with this framework. As adapted, has to be followed during the design, implementation and post implementation/operational phases of a specific sub-project investment. The plan gives the mitigation measures for each sub-project investment that will eliminate/mitigate adverse or negative environmental impacts. However, these plans need to be made site specific for each of the sub-project after undertaking the necessary assessments. The responsibility of handling mitigation measures for various environmental concerns at various stages of the project will be designated to different agencies according to the type and geographical location of the sub-projects.

Table 8: World Bank Project Categorization

Classification	Type of sub-project	Safeguard Instrument
Category A:	A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. The ESAP has been categorized as B and is envisaged not to have activities or subproject that fall within category A.	During project design and preparation the project will not have any category A subprojects as defined by the Bank Policy.
Category B:	A *Category B* project has potential adverse environmental impacts on human populations or environmentally important areas - including wetlands, forests, grasslands, and other natural habitats - which 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. The scope of EA for a *Category B* project may vary from project to project, but it is narrower than that of Category A assessment. Like Category A, a *Category B* environmental assessment examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.	This will be applicable on activities on the projects that will involve infrastructure and construction related activities for both on-grid and off-grid power connectivity. The project will broadly involve, grid extension and intensification, subsidized connections to low-income rural customers. A loan facility to support electrification of rural communities through private sector lead mini-grid developments and commercial sale of stand-alone systems. An ESIA, ESMP, RAPs or Environmental checklists/simplified ESMPs depending on the scale and intensity of impacts of subprojects will be applicable in identification and mitigation of impacts.
Category C:	A Category C project is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required.	This is relevant to the subprojects and activities that will focus on technical assistance without any physical works.

For Component A, ZESCO, as the subproject proponent, will prepare and implement safeguard instruments. ZESCO will thereafter submit the instrument to REA that through its Safeguards

Team in the PIU will confirm ZESCO's screening and submit to the Bank for review and clearance of the ESIA or a limited ESIA for category B subprojects.

For Component B1, the Subproject proponents will prepare and implement safeguard instruments. REA will screen subprojects and review and clear instruments and submit to the Bank for review and clearance of the ESIA or a limited ESIA for category B subprojects.

For Component B2, the Subproject proponents will prepare and implement safeguard instruments. DBZ will screen subprojects and review and clear instruments and submit to the REA. REA through its Safeguards Team in the PIU will confirm DBZ's screening and submit to the Bank for review and clearance of the ESIA or a limited ESIA for category B subprojects.

6.2.3 Appraisal and Approval of Environmental and Social Work

The Environmental Management Act (2011) of the Laws of Zambia read together with Statutory Instrument No. 28 of 1997 provides for Environmental Impact Assessment regulations that classify projects into either the First Schedule or Second Schedule depending on the size, nature and anticipated environmental consequences of a project or sub-project. The Zambia EIA Regulations provide lists of projects or sub-projects proto-types which fall under the two categories, detailed in Annex 9.

The completed screening form along with any additional planning reports (e.g. ESMP or RAP) is forwarded together with the overall sub-project application to the review authority – PIU in this regard. The first step in the approval process is to determine if all the relevant information has been provided, and is adequate. The competent authority in the PIU will also check if the beneficiaries and technical team have thoroughly considered all environmental and social issues with regards to the identification of potential adverse effects arising from the sub-project as well as mitigating measures to adequately address negative impacts. If, based on the desk appraisal and field appraisal, national legislation requires further review, PIU will refer the application to the competent approval authority, and ZEMA with recommendations for approval, conditions and implementation supervision (e.g. erosion control, waste management, human safety). The TOR's when drafted should be sent to the World Bank for review and clearance respectively. REA and ZESCO will share drafts of ESIA's, ESMP's and RAP's with the Bank for review and clearance at country or regional level depending on the complexity of the instrument.

6.3 Public Consultation and Disclosure

According to Zambia's EIA regulations (SI No. 28 of 1997) and World Bank Safeguards Policies, public consultations are an integral component of the EIA requirements, and the Guidelines identify the following principal elements:

- Developers are required to conduct public consultations during the preparation of Project Briefs and EIAs.
- The Director General of the Environmental Management Agency may, on the advice of the Technical Committee on Environment (TCE), conduct his or her own public consultation to verify the works of a developer.

- Formal EIA documents are made available for public review and comments. Documents to which the public has access include Project Briefs, EIA terms of reference, draft and final EIA reports, and decisions of the Director General of the Environmental Management Agency regarding project approval. The Director General, on the advice of the TCE, will develop practices and procedures for making these documents available to the public.
- Decision Letter approving projects will be published by the developer and displayed for public inspection.
- Public consultations are critical in preparing an effective proposal for the implementation of the project activities. These consultations should identify key issues and determine how the concerns of all parties will be addressed in response to the terms of reference for the EIA, which might be carried out for construction and rehabilitation proposals.

The ZEMA EIA regulations provide details concerning the public consultation methods. Such methods include information notices, brochures/fliers, interviews, questionnaires, community meetings and public hearings. In terms of Zambia's EIA process, public consultation should be undertaken during;

- The preparation of the EIA terms of reference;
- The carrying out of an EIA;
- ZEMA review of an EIA report; and
- The preparation of environmental terms and conditions of approval.

For the ESAP, the first step will be to hold public consultations with the local communities and all other interested/affected parties during the screening process. These consultations will be aimed at briefing the communities about the project activities, how the activities will be carried out and what sectors of the environment are likely to be impacted. The public consultations will be done in a participatory manner to encourage the communities to contribute to the screening process.

CHAPTER 7: MONITORING AND SUPERVISION ARRANGEMENTS

Adherence to the ZEMA EIA Regulations and World Bank safeguards policies usually raises challenges during the implementation phase of most projects. Therefore, the importance of monitoring is critical to the successful implementation of projects and sub-projects under ESAP. The objectives of the environmental and social management plan (ESMP) for the ESAP are to:

(1) Generate and provide policy makers, decision makers (at national and provincial level), implementers (at district and sub-district and community levels) investors[22], financiers and controlling authorities with timely information on the progress being achieved. This monitoring information will enable implementers to make informed decisions regarding appropriate adjustments in the implementation of the sub-projects;

(2) Determine whether the goals and objectives of the mitigation measures on ESAP have been achieved. This assessment of performance compares the baseline environmental and social conditions with the actual conditions at the time of monitoring of the projects and sub-projects in order to assess the extent to which the original environmental and social conditions have been restored, improved or made worse;

(3) Ensure that all activities relating to the operation and maintenance are being carried out in a manner that protects the environmental and social conditions without compromising the health and social well-being of the beneficiaries and target communities; and

(4) Ensure, where required, that any changes to the ESMPs are made with necessary suggestions for additional training and institutional capacity building in order to improve the performance of the ESMP implementation.

Supervision and monitoring is a key component of the ESMP during project implementation. Monitoring should be undertaken during the ESAP implementation phase to authenticate the effectiveness of impact management, including the extent to which mitigation measures are being successfully implemented. An ESMP should have the following components:

- Compliance monitoring;
- Impact monitoring; and
- Cumulative impact monitoring.

The aim of monitoring will be to:

1. Improve environmental and social management practices;
2. Check the efficiency and quality of the EA processes;
3. Establish the scientific reliability and credibility of the EA for the project; and
4. Provide the opportunity to report the results on safeguards and impacts and proposed implementation of mitigation measures.

7.1 Compliance Monitoring

[22] Investors are mainly from the private sector while financiers are bilateral and multilateral donors and MDBs

This is to authenticate that the required mitigation measures, which are the environmental and social commitments agreed on by the implementing agency, local implementing agencies and contractors are being adhered to. A monitoring framework will be developed based on agreed prototype sub-projects as they are specified in the positive list of projects. The PIU will be responsible for undertaking compliance monitoring.

7.2 Impact Monitoring

Monitoring of sub-projects impacts mitigation measures should be the duty of the PIU. The Environmental and Social Safeguards agreed in the contract specifications should be monitored to ensure that works are proceeding in accordance with the laid down mitigation measures. The PIU and implementing agencies should ensure that the project implementers submit reports on work progress and any challenges in observing the Environmental and Social Safeguards. The monitoring results should form a major part of the reports to be submitted by the PIU's to MoE and shared with ZEMA were applicable.

7.3 Cumulative Impacts Monitoring

The impacts of the ESAP on the environmental and social resources within the project areas should be monitored with consideration to other developments which might be established or already existing. There should be collaboration between the PIU and proponents of other development projects to compare Environmental and Social Safeguards guiding the individual projects implementation to ensure coordinated and comprehensive management of cumulative impacts. There are two aspects of monitoring in the PIU include; the first aspect takes into account the monitoring at ward and community level (project site) where the project is being implemented and; secondly, at the larger scale for all sub-projects at district and provincial level.

7.4 Annual Monitoring and Reviews

Environmental monitoring needs to be carried out during the implementation of the sub-projects. Monitoring of the compliance of sub-project implementation with the mitigation measures set out in the sub-project's ESMP and/or RPF/RAP will be carried out by the PIU, where relevant, jointly with the support from community leaders and local authorities. Compliance monitoring comprises on-site inspection of activities to verify that measures identified in the ESMP and/or RPF/RAP are being implemented. One of the monitoring tasks is to ensure that the contractor is achieving the required standards and quality of work. REA and ZESCO will oversee the inspections. An annual inspection report must be submitted (together with the monitoring report) to the World Bank for review and approval. Annual reviews may be carried out by an independent consultant, NGO or other service provider that is not otherwise involved with ESAP. The purpose of the reviews is to:

- To assess compliance with ESMF procedures, learn lessons, and improve future ESMF performance;
- To assess the occurrence of, and potential for, cumulative impacts due to project-funded and other development activities.

The annual reviews will be a principal source of information to the PIU for improving performance. Thus, they should be undertaken after the annual report on monitoring has been prepared and before World Bank supervision of the project.

CHAPTER 8: INSTITUTIONAL CAPACITY FOR THE ESMF IMPLEMENTATION

8.1 National Stakeholders

It is expected that the following institutions will play an active role in various components of the implementation of the ESMF on the ESAP.

8.1.1 Ministry of Energy

The PIU will be established under the REA. However, the MoE will be responsible for the overall coordination that will be carried out through a Project Steering Committee. It is anticipated that REA will be serving as a Fund Manager for all the project funds. ZESCO will be implementing activities under the Component A *On-grid Electricity Access Expansion.* Implementation arrangements for the Component B *Off-grid Electricity Access Expansion* are to be finalized depending on the design options being currently discussed. The implementation arrangements and fund flows will be finalized during appraisal. Implementation of Component C *Technical Assistance* will be carried out by both REA and ZESCO, depending on the activity (figure 1). The two institutions will assign dedicated project coordinators and teams to manage implementation of this project. A project steering committee will be set up, comprising MoE, REA, ZESCO, and any other relevant institutions to provide policy guidance and overall coordination.

8.1.2 Ministry of Finance (MoF)

The Ministry is charged with economic, national development planning and budgeting, and financial management responsibilities. The Ministry is headed by a Minister, while the administrative and technical team is headed by the Secretary to the Treasury who is assisted by two Permanent Secretaries responsible for Economic Management and Finance respectively. As the Ministry is responsible for coordinating national economic management, mobilizing and managing public resources in a transparent and accountable manner for sustainable national development, it will be a channel through which funds from the WB will be transmitted to the MoE for the REA and ZESCO PIU's. There will be need to enhance the capacity of the Ministry in financial management of World Bank funded projects as pervious projects take long to become effective.

8.1.3 Ministry of National Development Planning

The Ministry is charged with national planning and monitoring and evaluation as well as the coordination of economic and technical assistance from cooperating partners. In view of its mandate, the Ministry will be part of the project steering committee and in so doing ensure that project implementation is complementary to national development objectives.

8.1.4 ZESCO

ZESCO Limited is a vertically integrated electricity parastatal registered under the Companies Act. ZESCO was established in 1970 and is wholly owned by the GRZ. However, ZESCO operates as an autonomous entity that is monitored by the Government, through the Board of Directors, to ensure that performance benchmarks are met. The Company is mandated to generate, transmit, distribute and supply electricity throughout Zambia.

Generation
ZESCO's electricity generation is 99 percent hydro, and one percent thermal from diesel powered generators located in most districts of North Western Province. The total installed capacity stands at 2,337 Mega Watts (MW)

Transmission
Transmission Development Directorate (TD) is responsible for the development and maintenance of the infrastructure for use for efficient and reliable transportation of electricity from generating stations to bulk supply points and to large mining and industrial customers. The transmission grid is a highway for electricity delivery across the country and also forms part of the regional grid used for power exchange with other countries. The ZESCO transmission grid comprises transmission lines and substations at 330 kV, 220 kV, 132 kV and 66 kV voltage levels. The backbone of the grid is built on a robust 330 kV system from the southern part of the country where the major generating stations are located through Lusaka and Central provinces to the Copperbelt. ZESCO exports excess power particularly during off peak periods to Zimbabwe, South Africa, Namibia, Democratic Republic of Congo (DRC) at high voltage; Botswana, Namibia, Tanzania as well as DRC import at low voltage

ZESCO has over the years been working on various Bank funded projects including those financed by other development Banks such as the European Investment Bank (EIB). The institution has a well-established Environmental and Social Unit (ESU) that oversees the drafting of safeguards instrument and clearance, monitoring and also plays an active role in occupational health and safety. ZESCO will be one of the PIU's on the ESAP project.

8.1.5 REA
REA was established by the Act of Parliament No.20 of 2003 and was intended to be a special purpose vehicle for promoting the rural electrification agenda as the national utility since, ZESCO Limited the company which had the mandate hitherto be implementing the program on behalf of Government had concentrated on commercially viable ventures and projects. The Act also established the Rural Electrification Fund to support the rural electrification programme. Therefore, since 2004, REA has been the Government Special Purpose Vehicle (SPV) for managing the required resources for the rural electrification programme. REA has played a key role in the provision of electricity infrastructure to the whole nation targeting rural communities as mandated by Government.

Prior to the finalization of REMP which is the principle source of rural electrification projects, the REA had been carrying out work in all the ten provinces of Zambia in selected sites. The rural electrification projects target Rural Growth Centres (RGCs) as outlined in the REMP with immediate direct beneficiaries being public institutions. REA has been mandated with the tasks of administering and managing the Rural Electrification Fund (REF); developing and implementing the REMP, mobilizing funds to support rural electrification, encouraging private sector participation in rural electrification through provision of smart subsides, competitive bidding and community mobilisation, financing project preparation studies for rural electrification and recommending suitable policies to government. Of critical importance to REA is the identification of various technologies that can be tapped to improve the standard of living of rural populations. The REA

promotes renewable energy resources such as solar, mini-hydros, wind and biomass. Solar energy technology is being considered in some rural areas which will not benefit from the extension of the national grid and mini hydro potential in the immediate future. For such areas, solar energy becomes a more suitable form of applicable energy source until such a time that the national or isolated grids are taken nearer to these areas. This electrification programme will go on up to 2030 when it is anticipated that 51% rural electricity access rate will be attained.

Functions of REA

The purpose for which the Authority was created is to increase the availability of electricity in rural areas and access to electricity by the rural population. Its functions include, to:

- Administer and manage the REF
- Develop, implement and update rural electrification master plans for systematic electrification of rural areas
- Promote utilisation of available rural electrification technological options to enhance the contribution of energy to the development of Grid Extension, industry, mining and other economic activities in rural areas
- Offer on a competitive basis, the construction of rural electrification projects and periodically publish information on programmes being carried out
- Design and offer on a competitive basis, to developers or operators, smart subsidies for capital costs on projects that are designed to supply energy for development of rural areas
- In conjunction with stakeholders, develop mechanism for operation of grid extension networks for rural energy supply systems;
- Finance project preparation studies for rural electrification projects in accordance with guidelines developed and approved by the Authority
- Recommend to government policies for the enhancement of access to electricity by the rural population; and undertake such other activities as are conducive or incidental to the performance of its functions under the Act

REA has experience with working on Bank funded projects and participated in the implementation of the IAES project just recently closed. The institution further has an Environment Management and Community Mobilisation Units which oversea environmental and social risks on projects they are undertaking.

8.1.6 Development Bank of Zambia (DBZ)

The Government of Zambia established the Development Bank of Zambia (DBZ) in 1972 under the DBZ Act, in partnership with public sector financial institutions, the local private sector, and foreign institutions. DBZ is classified as a Financial Business under the Banking and Financial Services Act (BFSA) (1994) as amended. As of the 2015 year-end, GRZ is the majority shareholder with a 63.53 percent stake, the Export- Import Bank of India holds a 19.73 percent stake and DBSA holds the remaining 9.44 percent.

DBZ's mandate is to provide development finance and technical assistance on a financially sustainable basis to promote development in Zambia, largely in line with the priorities of the Sixth National Development Plan.

Component B.2. Loan Facility phase 2 activities (i.e. managing operationalized credit line for offgrid subprojects) will be delegated to DBZ, once the conditions for implementation of the second phase are met. To enable it, REA will enter into a Co- Execution Agreement with DBZ for implementing the sub-component activities. As a potential Financial Intermediary for phase 2 off-grid activities, DBZ will also have safeguard oversight responsibilities, for which it will receive appropriate capacity building under the technical assistance activities planned for phase 1. DBZ is in the process of forming a new four-person environmental and social assessment unit, and has a policy manual on environmental, health and social safeguards for its project lending. However DBZ phase 2 participation can only be initiated after a proper safeguard assessment is carried out which ensures that the arrangement and capacity meet the World Bank's minimum requirements under OP/BP10.00

8.1.7 Energy Regulation Board

The role of the ERB is that of balancing the needs of undertakings with the needs of energy consumers. The Board has the responsibility to ensure that utilities earn a reasonable rate of return on their investments that is necessary to provide a quality service at affordable prices to the consumer. In order to carry out this role, the ERB, among other functions, ensures that all energy utilities in the sector are licensed, monitors levels and structures of competition, investigates and remedies consumer complaints.

8.1.8 The Ministry of Local Government and Housing

The Ministry is charged with the administration of the local government system and will ensure that the people in the project areas are provided with the necessary municipal services. The Ministry of Local Government and Housing, is multi-functional in nature and oversees the implementation of delegated functions and responsibilities by the local authorities by managing the social, economic and political spheres of governance. This is in line with the Decentralisation Policy. The ministry is responsible for Co-ordination of Local Government Administration, Regulation and provision of social amenities, Affairs and House of Chiefs, Water Supply and Sanitation, Provision of housing, Provision of municipal infrastructure services and support services, and Provision of feeder, community and urban roads. The ministry will play a major role in insuring all planned project activities are in line with the urban planning of the municipality in which it falls.

8.1.9 Zambia Environmental Management Agency

The mandate of Zambia Environmental Management Agency (ZEMA) formerly called Environmental Council of Zambia (ECZ), is drawn from the Environmental Management Act (EMA) No. 12 of 2011. ZEMA plays a regulatory, advisory, consultative, monitoring, co-ordination and information dissemination role on all environmental issues in Zambia. The institution has sufficient institutional capacity to support project implementation and provisions of the ESMF.

8.2 Capacity Building Requirements

The main stakeholders for implementation of the ESMF are the line ministries and district representatives, implementing agencies of the relevant sub-components and the local authorities in the location of sub-projects as required. Capacity building will be provided based on the needs of the specific actors. Planning, designing and implementing of the ESAP programs and sub-projects in the target districts require an understanding of the environmental, social impacts and mitigation measures at community ward and district levels. Training events focusing on these thematic areas will take the form of courses, workshops and specific seminars at national, provincial and district level. Where necessary awareness campaigns may be used to complement or reinforce the trainings. Specific workshops on the ESMF/RPF and relevant World Bank safeguard policies triggered by this project will be organized for all key stakeholders. The technical staff in District Planning Sub Committee will be trained in World Bank safeguards requirements and the agreed requirements and procedures in this ESMF, in order to routinely support and monitor sub-projects.

The following additional training topics are proposed:

1. Environmental and social Screening Process and Checklists;
2. Zambian EIA Procedural Frameworks;
3. Preparation of simplified ESMP for sub-projects;
4. Environmental and Social Clauses in Contractors' contract and bidding documents;

Relevant staff in the REA and ZESCO and the MoE will be required to undergo some capacity building to have knowledge and understanding of the implementation of relevant World Bank policies triggered by the project.
The awareness creation, capacity building and training workshops will focus on (a) strengthened institutional coordination; (b) improved information for decision makers; and (c) targeted awareness creation. The target group will consist of selected officers directly involved in the implementation of the ESAP

Table 9: Capacity Building Requirements

Entity	Responsibilities under ESMF	Capacity building requirements
Ministry of Energy, REA ZESCO and DBZ	• Screening of sub-projects • Monitoring of compliance and implementation of mitigation mechanisms	• For new PIU: workshops on the ESMF/RPF and relevant World Bank safeguard policies • Environmental and social Screening Process and Checklists • Zambian EIA Procedural Frameworks • Preparation of simplified ESMP for sub-projects • Refresher courses in preparing ESIA, ESMP's and RAPs • Environmental and Social Clauses in Contractors' contract and bidding documents • Management of Pesticides , where applicable

Subproject proponents for Components A and B	• Preparing safeguard instruments (ESIA, ESMP, ARAP, RAP, etc.)	• Courses in preparing and implementing ESIAs, ESMPs, ARAP, RAP, etc. •
Communities and beneficiaries	• Oversight of implementation of Subprojects, including environmental and social mitigation mechanisms	• Basic environmental and social safeguards, training, including monitoring

8.3 Monitoring Indicators

Monitoring indicators are a very important part of the monitoring plan. The indicators should be:

(i) Specific to avoid ambiguity of items being measured;
(ii) Measurable to facilitate quantification; and
(iii) Quantifiable to be easily translated into units of measurement and to facilitate verification.

The table below (table 10) highlights the various monitoring indicators for the proposed subprojects on the ESAP project.

Table 10: Monitoring Indicators and Anticipated Sub Projects

Project Category	Anticipated Sub-Projects	Monitoring Indicators
Component 1: On-grid Electricity Access	• Grid extension and intensification; • Connection fee subsidy to low-income rural customers under a similar results-based approach as used under the IAES and GPOBA funded projects; and •	• Increased number of households and businesses connected to the nation grid • Improved quality of life and access to electric powered appliances and ICTS's
Component 2: Off-grid Electricity Access Expansion	• A subsidy scheme; and • A loan facility; to support electrification of rural communities through private sector lead mini-grid developments and commercial sale of stand-alone system.	• Increase electrical connectivity for off grid connections • Improved quality of life for beneficiary households and businesses. • Availability of affordable PV solar technologies in rural areas

8.4 Budget

The project has earmarked about US$200,000 for implementation of Environmental and Social Safeguard due diligence actions, mitigation measures, capacity building and monitoring activities defined in the ESMF.

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(11) ZAWA, 2005; Information Sheet on Ramsar Wetlands, https://rsis.ramsar.org/RISapp/files/RISrep/ZM1580RIS.pdf (Accessed, 24th May 2016).

ANNEX 1: ENVIRONMENTAL AND SOCIAL SCREENING FORM

PART A: GENERAL INFORMATION

Project Name
Estimated Cost ( )
Project Site
Project Objectives
Proposed Main Project Activities
Name of Evaluator/s
Date of Field Appraisal

PART B: BRIEF DESCRIPTION OF THE PROPOSED ACTIVITIES

- Provide information on the type and scale of the construction/rehabilitation activity (e.g. area, land required and approximate size of structures)
- Provide information on the construction activities including support/ancillary structures and activities required to build them, e.g. need to quarry or excavate borrow materials, water source, access roads etc.
- Describe how the construction/rehabilitation activities will be carried out. Include description of support/activities and resources required for the construction/rehabilitation.

PART C: ENVIRONMENTAL AND SOCIAL BASELINE INFORMATION OF THE SUB PROJECT SITE BRIEF DESCRIPTION

Category of Baseline Information	Brief Description
GEOGRAPHICAL LOCATION * Name of the Area * Proposed location of the project (Include a site map of at least 1:10,000 scale / or coordinates from GPS)	
LAND RESOURCES * Topography and Geology of the area * Soils of the area * Main land uses and economic activities	
WATER RESOURCES * Surface water resources (e.g. rivers, lakes, etc.) quantity and quality	
BIOLOGICAL RESOURCES * Flora (include threatened/endangered/endemic species) * Fauna (include threatened/endangered/endemic species) * Sensitive habitats including protected areas e.g. national parks and forest reserves	
CLIMATE * Temperature * Rainfall	
SOCIAL * Number of people potentially impacted	

* Type and magnitude of impacts (i.e. impact on land, structures, crops, standard of living) * Socio-economic overview of persons impacted	

PART D: SCREENING CRITERIA FOR IMPACTS DURING SUBPROJECT IMPLEMENTATION, AREAS OF IMPACTS AND IMPACTS EVALUATION AND POTENTIAL MITIGATION MEASURES

	Areas of Impacts		**Impacts Evaluation**						**Potential Mitigation Measures**
			Extent or coverage (on site, within 3-5km or beyond 5km)			Significance (Low, Medium, High)			
	YES	NO	On Site	Within 3-5 km	Beyond 5 km	Low	Medium	High	
	Is this sub-project site/activity within and/or will it affect the following environmentally sensitive areas?								
1.1	National parks and game Reserve								
1.2	Wet-lands								
1.3	Productive traditional agricultural /grazing lands								
1.4	Areas with rare or endangered flora or fauna								
1.5	Areas with outstanding Scenery/tourist site								
1.6	Within steep slopes/mountains								
1.7	Dry tropical forest								
1,8	Along lakes, along beaches, riverine								
1.9	Near industrial activities								
1.10	Near human settlements								
1.11	Near cultural heritage sites								
1.12	Within prime ground water recharge area - -								
1.13	Within prime surface run off								
1.14	Will the sub-project use international water sources?								
2.0	**Screening Criteria for Impacts during implementation and Operation**								
	Will the implementation and operation of the sub-project within the selected site generate the following externalities/ costs/impacts?								

	Areas of Impacts	Impacts Evaluation		Potential Mitigation Measures
2.1	Deforestation			
2.2	Soil erosion and siltation			
2.3	Siltation of watercourses,			
2.4	Environmental degradation arising from mining of construction materials			
2.5	Damage of wildlife species and habitat			
2.6	Increased exposure to agro-chemical pollutants			
2.7	Hazardous wastes, Asbestos, PCB's, pollution			
2.8	Nuisance - smell or noise			
2.9	Reduced water quality			
2.10	Increase in costs of water treatment			
2.11	Soil contamination			
2.12	Loss of soil fertility			
2.13	Salinization or alkalinisation of soils			
2.14	Reduced flow and availability of water			
2.15	Long term depletion of water resource			
2.16	Incidence of flooding			
2.17	Changes in migration patterns of animals			
2.18	Introduce alien plants and Animals			
2.20	Increased incidence of plant and animal diseases			
	Will the implementation and operation of the sub-project activities within the selected site generate the following socio-economic costs/impacts?			
3.1	Loss of land/land acquisition for human settlement, farming, grazing			
3.2	Loss of assets, property, houses, agricultural produce			
3.3	Loss of livelihood			
3.4	Require a RAP or ARAP			
3.5	Loss of cultural sites, graveyards, monuments			
3.6	Disruption of social fabric			
3.7	Interference in marriages for local people by workers			

	Areas of Impacts	Impacts Evaluation		Potential Mitigation Measures
3.8	Potential spread of STIs and HIV and AIDS, due to migrant workers			
3.9	Increased incidence of communicable diseases			
3.10	Health hazards to workers and communities			
3.12	Conflicts over use of natural resources e.g. water, land, etc.			
3.13	Conflicts on land ownership			
3.14	Disruption of important pathways, roads			
3.15	Increased population influx			
3.17	Loss of income generating Capacity			

PART E: SCREENING FORM TO IDENTIFY APPROPRIATE SAFEGUARDS INSTRUMENT

Questions	Answer		If Yes WB Policy triggered	Documents Required if Yes
	Yes	No		
Are the subproject impacts likely to have significant adverse environmental impacts that are sensitive, [23] diverse or unprecedented? [24] Please provide brief description:			*OP 4.01 Environmental Assessment* Category A	Project is not expected to have any category A subproject given their nature and scale. Any category A subproject will not be supported as the project is designed to only cover category B subprojects.

[23] Sensitive (i.e., a potential impact is considered sensitive if it may be irreversible, e.g., lead to loss of a major natural habitat, or raise issues covered by OP 4.04, Natural Habitats; OP 4.36, Forests; OP 4.10, Indigenous Peoples; OP 4.11, Physical Cultural Resources; or OP 4.12, Involuntary Resettlement; or in the case of OP 4.09, when a project includes the manufacture, use, or disposal of environmentally significant quantities of pest control products).

[24] Examples of projects where the impacts are likely to have significant adverse environmental impacts that are sensitive, diverse or unprecedented are large scale infrastructure such as construction of new roads, railways,

Questions	Answer		If Yes WB Policy triggered	Documents Required if Yes
	Yes	No		
Do the impacts affect an area broader than the sites or facilities subject to physical works and are the significant adverse environmental impacts irreversible? Please provide brief description:			*OP 4.01 Environmental Assessment* Category A	Ineligible for project financing as project design only takes into account category B subprojects.
Is the proposed project likely to have minimal or no adverse environmental impacts? [25] Please provide brief justification.			*OP 4.01 Environmental Assessment* Category C	No action needed beyond screening
Is the project neither a Category A nor Category C as defined above? [26] Please provide brief justification.			*OP 4.01 Environmental Assessment* Category B	Limited ESIA or ESMP
Are the project impacts likely to have significant adverse social impacts that are sensitive, diverse or unprecedented? [27] Please provide brief description.			*OP 4.01 Environmental Assessment* Category A	Subprojects are not expected to have these types of impacts. If yes, the subproject will not be financed as this is not accordance with project design.
Will the project adversely impact physical cultural resources? [28] Please provide brief justification.			*OP 4.11 Physical Cultural Resources*	Subprojects are not expected to have these types of impacts.

power plants, major urban development, water treatment, waste water treatment plants and solid waste collection and disposal, etc.

[25] Examples of projects likely to have minimal or no adverse environmental impacts are supply of goods and services, technical assistance, simple repair of damaged structures, etc.

[26] Projects that do not fall under Category A or Category C can be considered as Category B. Examples of Category B subprojects include small scale *in-situ* reconstruction of infrastructure projects such as road rehabilitation and rural water supply and sanitation, small schools, rural health clinics, etc.

[27] Generally, subprojects with significant resettlement-related impacts should be classified as Category A. Application of judgment is necessary in assessing the potential significance of resettlement-related impacts, which vary in scope and scale from subproject to subproject. Subprojects that would require physical relocation of residents or businesses, as well as subprojects that would cause any individuals to lose more than 10 percent of their productive land area, often are classified as Category A. Scale may also be a factor, even when the significance of impacts is relatively minor. Subprojects affecting whole communities or relatively large numbers of persons (for example, more than 1,000 in total) may warrant Category A, especially for projects in which implementation capacity is likely to be weak. Subprojects that would require relocation of Indigenous Peoples, that would restrict their access to traditional lands or resources, or that would seek to impose changes to Indigenous Peoples' traditional institutions, are always likely to be classified in Category A.

[28] Examples of physical cultural resources are archaeological or historical sites, including historic urban areas, religious monuments, structures and/or cemeteries, particularly sites recognized by the government.

Questions	Answer		If Yes WB Policy triggered	Documents Required if Yes
	Yes	No		
Will the project involve the conversion or degradation of non-critical natural habitats? Please provide brief justification.			*OP 4.04 Natural Habitats*	Not expected. If yes, subproject will be ineligible for financing as this is not in accordance with the project design.
Will the project involve the significant conversion or degradation of critical natural habitats?[29]			*OP 4.04 Natural Habitats*	Not eligible for financing
Does the subproject construct a new dam or rely on the performance of an existing dam or a dam under construction?			*OP 4.37 Dam Safety*	Not expected to be triggered given the types of subprojects
Does the project procure pesticides (either directly through the project, or indirectly through on-lending, co-financing, or government counterpart funding), or will it affect pest management in a way that harm could be done, even though the project is not envisaged to procure pesticides?			*OP4.09 Pest Management*	Not expected to be triggered
Does the subproject involve involuntary land acquisition, loss of assets or access to assets, or loss of income sources or means of livelihood? Please provide brief justification.			*OP 4.12 Involuntary Resettlement*	Resettlement Action Plan or an Abbreviated RAP
Are Indigenous Peoples' communities present in, or do they have collective attachment to, the subproject area?			*OP 4.10 Indigenous Peoples*	Not expected to be triggered
Will the project have the potential to have impacts on the health and quality of forests or the rights and welfare of people and their level of dependence upon or interaction with forests; or does it aim to bring about changes in the management, protection or utilization of natural forests or plantations? Please provide brief justification.			*OP4.36 Forestry*	Not expected to be triggered
Will the project have the potential to have significant impacts on, or significant conversion or degradation of critical natural forests or other natural habitats?			*OP4.36 Forestry*	Not eligible for financing
Is there any territorial dispute between two or more countries in the subproject area and in the area of its ancillary aspects and related activities?			*OP7.60 Projects in Disputed Areas*	Not expected to be triggered

[29] Subprojects that significantly convert or degrade critical natural habitats such as legally protected, officially proposed for protection, identified by authoritative sources for their high conservation value, or recognized as protected by traditional local communities, are ineligible for Bank financing.

Questions	Answer		If Yes WB Policy triggered	Documents Required if Yes
	Yes	No		
Will the subproject and its ancillary aspects and related activities, including detailed design and engineering studies, involve the use or potential pollution of, or be located in international waterways?[30]			*OP7.50 Projects on International Waterways*	Not expected to be triggered.

Conclusion and Safeguards Instruments Required

The subproject is classified as a Category _____ project as per World Bank OP 4.01, and the following safeguard instruments will be prepared:

1. _____
2. _____
3. _____
4. _____
5. _____

[30] International waterways include any river, canal, lake or similar body of water that forms a boundary between, or any river or surface water that flows through two or more states.

ANNEX 2: GENERIC ENVIRONMENTAL PROJECT BRIEF REPORT (EPB) FORMAT

EXECUTIVE SUMMARY

- Briefly describe the proposed project, location, investment cost, alternatives considered, major impacts, and environmental management commitments objectives, relevant legislation, technology, project alternatives, main findings and lifespan.

TABLE OF CONTENTS

1.0 INTRODUCTION

- Give a brief project background, objectives.
- Summary description of the project including project rationale
- The developer's physical address and the contact person.
- Particulars of Shareholders and Directors
- Track Record (Previous Experience of Enterprise)
- Brief description of the Location
- Percentage of shareholding by each shareholder
- The developer's physical address and the contact person and details.
- Total Project Cost/Investment
- Proposed Project Implementation Date

2.0 LEGAL AND POLICY FRAMEWORK

2.1 **Policy, legal and institutional framework relevant to the project**

- Policy, legal and institutional framework relevant to the project
- Specific sections of the cited policy, legal and institutional framework relevant to the proposed project.
- Relevance of cited sections to the proposed development
- Compliance (how the development complies/will comply to the cited sections)

2.2 **International agreements and Conventions**

- International agreements and conventions relevant to the proposed project.
- Specific sections of the agreements and conventions relevant to the proposed project.
- Relevance of cited sections of the agreement or convention to the proposed development
- Compliance (how the development complies/will comply to the cited sections)

3.0 DESCRIPTION OF THE PROJECT

3.1 **Location**

- Describe the project location supported by a location map drawn to an appropriate scale with a legend, direction of the True North. The location map must be printed on at least "A3" paper size for it to be clear.
- Provide the spatial extent of the proposed project site(Province, City/Municipality/district, specific site)
- Provide land marks and their distances from the proposed site to help identify proposed project site
- Identify surrounding developments
- Provide coordinates of the proposed site where applicable

3.2 **Nature of the Project**

- Raw materials (including hazardous materials and their storage on site)

- Process and technology (including flow diagrams)
- Products and by-products
- Production capacity
- Schedule and life time of the project

3.3 **Main activities**

- Site preparation phase
- Construction phase
- Operation phase

4.0 Project Alternatives

i. Identification of alternatives such as but not limited to:

a. Project need
b. Site
c. Design
d. Technology
e. Process
f. Raw materials
g. Justification for the selected option(s)

ANNEX 3: ENVIRONMENTAL AND SOCIAL IMPACT STATEMENT FORMAT

EXECUTIVE SUMMARY

- Briefly describe the project background, objectives, location, shareholders, investment cost, project description, technology, project alternatives, potential impacts, mitigation/enhancement measures and lifespan.
- The executive summary should be signed by the developer and the study team.

NON TECHNICAL SUMMARY (In English and a local language commonly understood in the project area).

A **summary (<u>not detailed</u>)** description of the proposed project in a layman's language including:

- the project
- location
- investment cost
- major potential impacts
    - Positive: e.g. Employment opportunities, boosting of local economy, infrastructure development,
    - Negative: e.g. damage to land, plants and animals; pollution of water & air; displacement of people;
- mitigation for negative impacts and enhancement measures for positive impacts

TABLE OF CONTENTS

3.0 PROJECT DESCRIPTION

3.1 **Location**

- Provide the spatial extent of the proposed project site(Province, City/Municipality/district, specific site)
- Provide land marks and their distances from the proposed site to help identify proposed project site
- Identify surrounding developments
- Provide coordinates of the proposed site where applicable

3.2 **Nature of the Project**

- Raw materials (including hazardous materials and their storage on site)
- Process and technology (including flow diagrams)
- Products and by-products
- Production capacity
- Schedule and life time of the project

3.3 **Main activities**

- Site preparation phase
- Construction phase
- Operation phase

4.0 Project Alternatives

4.1 Identification of alternatives such as but not limited to:

ii. Product/service
iii. Site
iv. Design
v. Technology
vi. Process
vii. Raw materials
viii. (water, soil, air, flora, fauna)

- Any relevant legal documents (title deeds or lease agreements, certificates of Incorporation, agreements, asset valuation reports, approval documents, Investment License etc);
- Bibliography
- Any other relevant supporting documents or information that cannot be presented in the main report

ANNEX 4: GENERIC ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

INTRODUCTION

The objective of the project is to increase electricity access in targeted rural areas of Zambia. The project will comprise three components namely; on-grid electricity access expansion, off-grid electricity access expansion and technical assistance. Once the site details have been confirmed and design firmed up, an Environmental Social Management Plan (ESMP) will be prepared to supplement the designed mitigation measures. The monitoring of environmental quality will be part of the main project design to assess the performance of the intervention and will be integrated into the ESMP.

EXECUTIVE SUMMARY

Briefly describe the proposed project, location, investment cost, alternatives considered, major impacts, and environmental management commitments objectives, relevant legislation, technology, project alternatives, main findings and lifespan.

TABLE OF CONTENTS

1.0 INTRODUCTION

- Give a brief project background, objectives.
- Summary description of the project including project rationale
- The developer's physical address and the contact person.
- Particulars of Shareholders and Directors
- Track Record (Previous Experience of Enterprise)
- Brief description of the Location
- %age of shareholding by each shareholder
- The developer's physical address and the contact person and details.
- Total Project Cost/Investment
- Proposed Project Implementation Date

2.0 LEGAL AND POLICY FRAMEWORK

2.1 Policy, legal and institutional framework relevant to the project

- Policy, legal and institutional framework relevant to the project
- Specific sections of the cited policy, legal and institutional framework relevant to the proposed project.
- Relevance of cited sections to the proposed development
- Compliance (how the development complies/will comply to the cited sections)

2.2 International agreements and Conventions

- International agreements and conventions relevant to the proposed project.
- Specific sections of the agreements and conventions relevant to the proposed project.
- Relevance of cited sections of the agreement or convention to the proposed development
- Compliance (how the development complies/will comply to the cited sections)

3.0 DESCRIPTION OF THE PROJECT

3.1 Location

- Describe the project location supported by a location map drawn to an appropriate scale with a legend, direction of the True North. The location map must be printed on at least "A3" paper size for it to be clear.
- Provide the spatial extent of the proposed project site(Province, City/Municipality/district, specific site)

- Provide land marks and their distances from the proposed site to help identify proposed project site
- Identify surrounding developments
- Provide coordinates of the proposed site where applicable

3.2 **Nature of the Project**

- Raw materials (including hazardous materials and their storage on site)
- Process and technology (including flow diagrams)
- Products and by-products
- Production capacity
- Schedule and life time of the project

3.3 **Main activities**

- Site preparation phase
- Construction phase
- Operation phase

4.0 PROJECT ALTERNATIVES

i. Identification of alternatives such as but not limited to:
   a) Project need
   b) Site
   c) Design
   d) Technology
   e) Process
   f) Raw materials
   g) Justification for the selected option(s)
ii. Analysis of each of the identified alternatives
iii. List of chosen alternatives in order of preference
iv. Reasons for choosing the preferred alternatives and rejecting the other alternatives

5.0 DESCRIPTION OF THE BASELINE ENVIRONMENT

5.1 **Ecological Resources**

a. Fauna

- Terrestrial species (Include common names and respective scientific names)
- Aquatic species (Include common names and respective scientific names)
- Identification of rare or endangered species (Include common names and respective
- Scientific names)

b. Flora

- Terrestrial species (Include common names and respective scientific names)
- Aquatic species (Include common names and respective scientific names)
- Identification of rare or endangered species (Include common names and respective scientific names)

c. Birds

- Field survey of bird species (Include common names and respective scientific names)
- Identification of rare and endangered bird species

5.2 Geology and Hydrogeology
5.3 Drainage
5.4 Climate

5.5 Landscape and Topography
5.6 Land Use and Soils
5.7 Ground and Surface Water
5.8 Air quality and Noise
5.9 Social, Economic and Cultural Issues
5.10 Built Environment

6.0 ENVIRONMENTAL & SOCIAL IMPACTS

Identify and discuss

6.1 **Positive Impacts**
- 6.1.1 Socio-economic Environment
- 6.1.2 Physical Environment
- 6.1.3 Biological Environment

6.2 **Negative Impacts**
- 6.2.1 Socio-economic Environment
- 6.2.2 Physical Environment
- 6.2.3 Biological Environment

6.3 Methodology of Impact Evaluation

Evaluation of impacts for significance should combine:
- the frequency of occurrence of the impact
- the duration of the impact
- the severity of impact
- the spatial extent of the impact
- the sensitivity of the element being impacted.

7.0 ENVIRONMENTAL SOCIAL MANAGEMENT PLAN (State the Environmental Management Commitments for mitigating negative Environmental Impacts identified in Section 6.0 and measures for enhancing positive impacts.
7.1 Environmental Monitoring Plan (These should include environmental management cost estimates, responsible personnel and the frequency of monitoring)

Aspect	Impact	Mitigation/ Enhancement measure	Frequency of Monitoring	Time frame	Performance indicator	Responsible person	Cost

7.2 Budget
7.3 Implementation Timeline

8.0 DECLARATION OF AUTHENTICITY OF REPORT CONTENTS

9.0 BIBLIOGRAPHY
10.0 APPENDICES

- Maps and satellite images
- Figures (tables, charts, graphs, models, photographs);
- Certificate of Incorporation
- Investment License
- Title deeds or lease agreements

- Certificates of Incorporation
- Agreements
- Asset valuation reports
- Approval documents
- Any other relevant supporting documents or information that cannot be presented in the main report

ANNEX 5: CHANCE FIND PROCEDURES

Chance Find Procedure is a step by step procedure which outlines what needs to be done when projects come across archeological sites, historical sites, remains and objects, including graveyards and/when individual graves during excavation or construction. This procedure relates to OP/BP 4.11- Physical Cultural Resources – which addresses physical cultural resources which are defined as movable or immovable objects, sites, structures that have archeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below the ground.

If during civil works, sub project discover archeological sites, remains and objects, including those of cultural and religious significance and/or individual graves during excavation or construction, the implementers will carry out the following steps:

1. Stop the construction activities in the area of the chance find;
2. Delineate the discovered site or area;
3. Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged
4. The National Heritage and Conservation Commission NHCC) will be notified should a chance find be cited and offer guidance on how such sensitive findings should be handled.
5. Responsible authorities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archeologists. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
6. Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities
7. Construction work could resume only after permission is given from the responsible local authorities or department responsible for culture or antiquities concerning safeguard of the heritage.

ANNEX 6: ENVIRONMENTAL AND SOCIAL GUIDELINES FOR CONSTRUCTION CONTRACTOR

The guidelines include provisions for proper management of construction sites, safe storage of construction materials and safe disposal of wastes

General Considerations

- The contractor shall follow the World Bank Group Environment, Health and Safety Guidelines which should become the basis for preparing the site-specific EHS Plan. For details please refer : www.ifc.org/EHSguidelines
- The contractor in all his activities ensure maximum protection of the environment and the socio-economic wellbeing of the people affected by the project, whether within or outside the physical boundaries of the project area.
- Before any construction works begin, the contractor shall ensure that the relevant environmental and land acquisition certificates of authorization for the works have been obtained from the relevant authorities
- In general, the contractor should become familiar with the environmental and social screening process and the Resettlement Policy Framework (RPF) for this project. The contractor shall work in cooperation and in coordination with the Project Management Team and/or any other authority appointed to perform or to ensure that the social and environmental work is performed according to the provisions of the safeguards documents
- The contractor shall pay close attention to health and safety requirements for workers who must wear protective clothing if required. The artisan should also ensure the health and safety of the community adjoining any construction areas.
- The contractor shall always keep on site and make available to Environmental Inspectors or any authorized persons, copies of the ESMPs, RAPs and ARAPs for the monitoring and evaluation of environmental and social impacts and the level or progress of their mitigation.
- The contractor shall ensure that construction materials such as sand, quarry stone, soils or any other construction materials are acquired from approved suppliers and that the production of these materials by the suppliers or the contractor does not violate the environmental regulations or procedures
- The movement and transportation of construction materials to and within the construction sites shall be done in a manner that generates minimum impacts on the environment and on the community, as required by the ESMP.
- Construction materials shall be stored in a manner to ensure that:
  - There is no obstruction of service roads, passages, driveways and footpaths;
  - Where it is unavoidable to obstruct any of the service paths, the contractor shall provide temporary or alternate by-passes without inconveniencing the flow of traffic or pedestrians;
  - There is no obstruction of drainage channels and natural water courses;
  - There is no contamination of surface water, ground water or the ground;
  - There is no access by public or unauthorized persons, to materials and equipment storage areas;
  - There is no access by staff, without appropriate protective clothing, to materials and equipment storage areas;
  - Access by public or unauthorized persons, to hazardous, corrosive or poisonous substances including asbestos lagging, sludge, chemicals, solvents, oils or their receptacles such as boxes, drums, sacks and bags is prohibited;

- Access by staff, without the appropriate protective clothing, to hazardous, corrosive or poisonous substances including asbestos lagging, sludge, chemicals, solvents, oils or their receptacles such as boxes, drums, sacks and bags is prohibited.

- Construction waste includes but is not limited to combustion products, dust, metals, rubble, timber, water, wastewater and oil. Hence construction waste constitutes solid, liquid and gaseous waste and smoke.
- In performing his activities, the contractor shall use the best practical means for preventing emissions of noxious or offensive substances into the air, land and water. He shall make every effort to render any such emissions (if unavoidable) inoffensive and harmless to people and the environment. The means to be used for making the emissions harmless or for preventing the emissions shall be in accordance to the RAPs, or the ESMPs and with the approval of the relevant Local Authority or ZEMA.
- The contractor shall, in particular, comply with the regulations for disposal of construction/demolition wastes, waste water, combustion products, dust, metals, rubble and timber. Wastewater treatment and discharge will conform to the applicable regulations by the relevant guidelines.
- Asbestos wastes, PCBs and other hazardous wastes shall be treated and disposed of in conformity with the national regulations and World Bank Group standards where applicable, with the supervision of qualified personnel.
- The contractor shall protect the health and safety of workers by providing the necessary and approved protective clothing and by instituting procedures and practices that protect the workers from dangerous operations. The contractor shall be guided by and shall adhere to the relevant national Labor Regulations for the protection of workers. Appropriate information and awareness on HIV/AIDS shall be conducted at each construction site.

ANNEX 7: SAMPLE TOR'S

SAMPLE TERMS OF REFERENCE FOR ENVIRONMENTAL AND SOCIAL IMPACT STATEMENT (EIS)

GENERAL GUIDANCE ON PREPARATION OF TERMS OF REFERENCE

1. INTRODUCTION

i. State what the document is all about and for what project the EIS is meant
ii. State on whose behalf the Terms of Reference (TORs) are being prepared
iii. State the purpose and objectives of the TORs
iv. State what the document seeks to identify, what nature, scope and extent of information that will be collected and assessed in conducting the EIA for the project
v. State study area (project Location).

1.1. PROJECT BACKGROUND

i. Give a detailed overview of the company providing:
   a. A corporate profile; and,
   b. The name of the legal entity that will develop, manage and operate the Project and hold the operating approvals.
ii. Describe the major components of the proposed project, the implementing agents, and a brief history of the project and its current status.

2. REGULATORY FRAMEWORK AND CORPORATE REQUIREMENTS

Summarise the applicable guidelines, procedural aspects, Acts, rules, regulations and policies to be followed in the preparation of EIA report for the proposed project as follows:

i. National and International Regulations and Guidelines
ii. Corporate Standards and Guidelines

3. PROJECT DESCRIPTION

i. Outline a full description of the project using appropriate maps including a general layout
ii. State the size of the area that will be covered by the proposed project.
iii. Outline the key project components such as

   a. Designs
   b. Volume and grade of resource
   c. Production rate
   d. Infrastructure to be installed

iv. State all the anticipated wastes from the project cycle

4. EIA SCOPE OF WORK

i. Outline the spatial extent of the boundaries of the study and any adjacent or remote areas which should be considered with respect to the project.
ii. Describe how the EIA work will be undertaken and the tasks to be performed.

5. EIA METHODOLOGY

i. Describe how the baseline data will be gathered and explain how they will be used. The methodologies to be used for data collection should be briefly described. The study goals must be clearly defined
ii. Wherever possible, propose predictive, quantitative models and standards that will be used to avoid vague and subjective predictions

6. EIA SCHEDULE

Propose a schedule that will be followed accordingly.

7. EIS REPORTING AND OUTPUTS

Outline the EIS structure that will be presented.

8. BASELINE INFORMATION OF THE PROJECT TO INCLUDE:

Propose categories of baseline information to be gathered and specialized studies to be conducted in the study area such as:

i. Climate
ii. Air quality
iii. Soils
iv. Geology
v. Hydrology (ground and surface water quality inclusive)
vi. Topography
vii. Land use and land tenure
viii. Noise and vibration
ix. Built environment
x. Fauna
xi. Flora
xii. Socio-economic environment (*Initial Social Assessment should among other factors identify the population, social services and amenities, vulnerability and direct consultation with people who may be directly affected by the project).*
xiii. Archeology and Cultural set up

9. STAKEHOLDER CONSULTATION

Identify key issues from the scoping meetings that need to be incorporated in the study and extract and incorporate them into the TORs for the EIA study.

10. DETERMINATION OF POTENTIAL IMPACTS OF THE PROPOSED PROJECT

List potential environmental and social impacts that may arise as a result of project implementation. These impacts will be determined based on socio-economic, environment and health aspects of project activities during construction and implementation stages. The choice of remediation techniques and locational aspects of project will be an important criteria in determining the potential impacts of subproject activities.

11. ANALYSIS AND EVALUATION OF IMPACTS

Describe how the impacts will be analyzed and evaluated.

12. IDENTIFICATION OF PROJECT ALTERNATIVES

Outline project alternatives to be considered during EIA such as

i. Project need

ii. Site
iii. Design
iv. Technology
v. Process
vi. Raw materials
vii. Others

13. PROPOSED EIA TEAM

i. Provide a list of EIA specialists/experts, together with their key qualifications and affiliations
ii. A description of proposed team staff should be presented including bio-data for all key personnel
iii. State the role of each EIA team member
iv. The CVs should reflect the team members' contact details and
v. The CVs should be signed by respective team members.

14. DECLARATION OF AUTHENTICITY OF REPORT CONTENTS

Make a declaration of the authenticity of report contents

15. OTHER RELEVANT INFORMATION/APPENDICES

Provide a preliminary list of the supporting information that is expected to be used in the preparation of the EIA report. The list should include:

vi. Scoping Report;
vii. Maps;
viii. Photographs;
ix. Tables;
x. Charts;
xi. Graphs;
xii. Signed list of meeting attendees;
xiii. meetings minutes;
xiv. company permits and certificates;
xv. CVs of each member of the EIA team and any questionnaires to be used for preparing the report and
xvi. Any other relevant documents.

ANNEX 8: DRAFT GRIEVANCE REDRESS MECHANISM

The Grievance redress mechanism will be set up at PIU level who will be responsible to maintain records of all complaints and their responses. A report of GRM performance will be consolidated as part of biannual M&E report, to be submitted to the MoE. The GRM will follow that channels highlighted in the illustrations below.

	Focal Point Unit/Organizations	Focal Persons	Role and Responsibilities	
			When a complaint is submitted	***Recording complaints***
PIU	Project Implementation Unit (PIU) *(REA and ZESCO)*	○ Project Coordinator - ESAP *(REA and ZESCO)* ○ Director Planning and Information (MCTI) ○ M&E Officer ○ Independent Auditor	The PIU with the support of the MoE (or an independent auditor) will try to address it. ❖ The PIU will respond to all complaints within 10 business days. ❖ If not resolved, the complaint will be reported to the PS at the MoE	1. Record the complaint submitted in the PIU grievance database. 2. Review monthly monitoring submitted by the district/provincial-level, and enter all complaints with the status will be recorded in the grievance database. 3. M&E officer will periodically review the grievance database and follow-up with focal persons to ensure all cases are addressed. 4. Every 6 months, PIU will include performance of GRM report as part of M&E report and submit to MoE which will be shared with the Bank
CONTRACTORS AND CBE's/CBO's	Contractors	○ Sub Project Managers ○ Site Manager ○ Community Leaders ○ Traditional Leader	The focal persons on site will try to address it at site level. ❖ The focal person on site will respond to all complaints within 10 business days. ❖ If not resolved, the complaint will escalated to the PIU.	1. Record the complaint submitted in a simple form. 2. Submit the record of complaints to the Project Manager

ANNEX 9: CLASSIFICATION OF PROJECTS UNDER ZAMBIA EIA

The objective of the project is to increase electricity access in targeted rural areas of Zambia. The project will comprise three components namely; on-grid electricity access expansion, off-grid electricity access expansion and technical assistance. Once the site details have been defined, identified and design firmed up, an Environmental Social Management Plan (ESMP) will be prepared to supplement the designed mitigation measures. The monitoring of environmental quality will be part of the main project design to assess the performance of the intervention and will be integrated into the EMSP.

The Environmental Management Act (2011) of the Laws of Zambia read together with Statutory Instrument No. 28 of 1997 provides for Environmental Impact Assessment regulations that classify projects into either the First Schedule or Second Schedule depending on the size, nature and anticipated environmental consequences of a project or sub-project. The Zambia EIA Regulations provide lists of projects or sub-projects proto-types which fall under the two categories

First Schedule: These are projects or sub-projects with minimal negative impacts on the environment and may require preparation of project briefs to determine the safeguards category. Examples relevant on the ESAP will include:

a) Urban area rehabilitation.
b) Hydro power schemes and electrification.

Others are;

a) Projects located in or near environmental sensitive areas such as:-
    i. indigenous forests;
    ii. wetlands;
    iii. zones of high biological diversity;
    iv. areas supporting populations of rare and endangered species;
    v. zones prone to erosion or desertification;
    vi. areas of historical and archaeological interest;
    vii. areas of cultural or religious significance;
    viii. areas used extensively for recreation and aesthetic reasons;
    ix. areas prone to flooding and natural hazards;
    x. water catchments containing major sources for public, industrial or agricultural uses; and
    xi. areas of human settlements (particularly those with schools and hospitals).

Second Schedule: These are projects that require an extensive evaluation of activities likely to have significant negative impacts on the environment and require undertaking a detailed Environmental Impact Assessment. Examples on the ESAP broadly include:

Electrical Infrastructure

- Electricity generation station.
- Electrical transmission lines - 220 KV and more than 1 Km long.
- Surface roads for electrical and transmission lines for more than 1Km long.

Dams, Rivers and Water Resources

- Dams and barrages: covering a total of 25 Ha or more.
- Exploration for, and use of, ground water resources including production of geothermal energy: water to be extracted to be more than 2 million cumecs m^3/s.

ANNEX 10: LIST OF STAKEHOLDERS CONSULTED DURING THE PREPARATION OF THE ESAP

Table 11: Individuals and Organizations Consulted During Preparation of ESAP

Name	Title	Email	Telephone
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Development Bank of Zambia			
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