MODULE 4

Appendices

APPENDIX 1

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APPENDIX 2

List of consulted stakeholders

LIST OF CONSULTED STAKEHOLDERS

Burundi

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- Mr. Stanislas Nsabimana, Head of the Department of Geography, University of Burundi.

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- Mr. Mawalala, Director of the Department of Water Resource, Ministry of Environment.
- Mr. Cifarha Male, Rural Electrification Officer, Société Nationale d'Électricité (SNEL), PTC member.
- Mr. Badila, Ministry of Energy.

Egypt

- Eng. Hassan Mahmoud, General Manager of Technical Offices, Ministry of Electricity and Energy, PTC member.
- Eng. Hoda Wadia, Egyptian Electricity Holding Company, PTC member.
- Eng. Maher Haziz, Managing Director for Environmental Sector, Egyptian Electricity Holding Company.
- Dr. Eng. Ithar Khalil, National Project Coordinator, Nile Transboundary Environmental Action project, NBI.
- Dr. Hisham El Agamawy, General Director of Energy Projects, Egyptian Environmental Affairs Agency.
- Eng. Mahmoud A. Shawky, General Director of Industrial Projects, Egyptian Environmental Affairs Agency.

Ethiopia

- Dr. Fatma Moustafa, PCU manager, ENTRO, NBI.
- Mr. Zelalem Gebrehiwot, Assistant Director Corporate Planning, Ethiopian Electric Power Corporation, PTC member.
- Mr. Teferra Beyene Asfaw, Advisor to the Minister, Ministry of Water Resources, PTC member.

- Mr. Michael Abebe, Head, Dams and Hydropower Design, Ministry of Water Resources, PTC member.
- Mr. Solomon Kebede, Head of EIA Service, Federal Environmental Protection Agency.
- Mr. Mohammed Ali, Head of Environmental Pollution Control Department, Federal Environmental Protection Agency.
- Dr. Babiker Abdalla Ibrahim, PCU environmentalist, ENTRO, NBI.

Kenya

- Mr. John Githinji, Ministry of Energy, PTC member.
- Mr. Albert Mugo, Power System Development Manager, Kenya Power Lighting Co., PTC member.
- Mr. David Mwangi, Kenya Power Lighting Co., PSC member.
- Mr. Boniface Kinyanjui, Kenya Power Lighting Co.
- Mr. Martin Shimba, National Environmental Management Authority.
- Ms. Minnie Ndindiri, Kenya Power Lighting Co.
- Mr. F. Msuya, Lake Victoria Commission.

Rwanda

- Mr. Alexis Karani, Director of Planning of the Ministry of Infrastructures.
- Mr. Félicien Ndabamenye, Power Generations Projects Officer, Ministry of Infrastructures, PTC member.
- Mr. Désiré Nzayanga, NELSAP, PTC member.

Sudan

- Mr. Henry Busulwa, Wetlands Lead Expert, Nile Transboundary Environmental Action project, NBI.
- Mr John Omwenga, Water and Sanitation Lead Expert, Nile Transboundary Environmental Action project, NBI.
- Dr. Ahmed Abdelsalam, National Project Coordinator, Nile Transboundary Environmental Action project, NBI.
- Ms. El Khitma El Awad, Ag. General Secretary Higher Council for Environment and Natural Resources.

- Mr. Amin Sabri Ahmed, Secretary General, Sudan Electricity Regulatory Authority.
- Mr. Mario Peter Ugali, Director Planning and Information, Sudan Electricity Regulatory Authority, PTC member.
- Mr. Salah Eldin Ali Mohamed Nour, Director General, Advisory Commission for Environment and Safety of the Ministry of Energy and Mining.
- Eng. Osman Ahmed A. Kariem, Director General Directorate of Planning and Projects of the Sudan Electricity Regulatory Authority.

Tanzania

- Mr. Lebby Chengulla, Senior Planning Engineer, TANESCO, PTC member.
- Erick Buberwa (on behalf of Mr. Leonard Masanja – PTC member), Ministry of Energy and Minerals.
- Mr. Kabiruddin Rahim Abdullar, Director Corporate Planning and Research, TANESCO.
- Mr. Mansour, Environmentalist, TANESCO.

Uganda

- Dr. Henry Aryamanya Mugisha, Executive Director, National Environment Management Authority (NEMA), Kampala.
- Mr. Arnold Ayazika Waiswa, EIA Co-coordinator, National Environment Management Authority (NEMA), Kampala.
- Mr. Tom Waako, Program Officer, NBI Secretariat, Entebbe.
- Mr. Fred Sajjabi, Senior Energy Officer, Ministry of Energy and Mineral Development.
- Mr. Gerald Muganga, Engineering Services Manager, Uganda Electricity Transmission Co. Ltd, Kampala.
- Mr. Henry Bidasala Igaga, Assistant Commissioner Electrical Power, Ministry of Energy and Mineral Development, Kampala.

APPENDIX 3

Public consultation in the environmental assessment process

PUBLIC CONSULTATION IN THE ENVIRONMENTAL ASSESSMENT PROCESS

Procedures and methodology

Many documents provide detailed and useful information on the procedures and methodologies for public consultation in the environmental assessment process. The following documents may serve as references:

- André, Pierre, Delisle, Claude E., Revéret, Jean-Pierre, **Environmental Assessment for Sustainable Development** , **Processes, Actors and Practice**, Presses Internationales Polytechnique, Montreal, 2004, 511 pages. Chapter 8 is dedicated to public participation.
- World Bank, **Environmental Assessment source book Update**, **Public consultation in the EA process: A strategic approach**, Number 26, May 1999, 14 pages.

Based on the quoted references, this appendix provides summarized information on: 1) the consultation objectives at each step of the EA process; 2) the designing and implementation of a public consultation plan and; 3) the tools and techniques for public consultation.

1. Consultation objectives

In the environmental assessment process, consultation of the stakeholders is mandatory to deliver a sustainable project and to protect the affected communities notably the vulnerable groups.

Public consultation must be integrated throughout the life cycle project, from planning to implementation, monitoring and evaluation. Consultation goals can be specified for each stage of this continued process. They figure on the following table.

Phases	Objectives
Before the project notice	Establish and maintain credibility Avoid the propagation of rumours and false information Demonstrate respect for local communities by informing them first Recognize the potential actors
Preliminary screening	Recognize the importance given by the public to the project and its environmental impacts
Scoping	Identify the principal environmental issues Establish project alternatives Establish links with actors
Assessing impacts	Do as much as possible to favour acceptance of the project Collect and update information Lay the bases for consensus Involve the public in impact assessment and identification of mitigation measures Reconcile interests in the development of the environmental management plan, including monitoring and follow-up programs
Review	Ensure a quality assessment Define present and future conflicting values Assess social acceptability Search for consensus Identify and find responses to unresolved questions Bring out mitigation measures and acceptable forms of compensations, including new ones
Decision	Reach specific agreements to facilitate integration of the project Reaffirm one's position Obtain second options of specific issues
Monitoring and follow-up	Inform the public of success in applying mitigation measures and in implementing the measures imposed with the decision Assure the public that the Project Proponent respects the environment Involve the public in monitoring and follow-up

Source: André, Pierre. , Delisle, Claude E., Revéret, Jean-Pierre, 2004, p.223.

2. Designing and implementation of a public consultation plan

Designing and implementation of a public consultation plan for a power project raises some issues. They are exposed below.

Definition of specific goals: Though the broad goals of consultation at each stage of the life cycle have been defined in the above table, specific goals must be assigned in relation with the project examined. In addition, they may include building capacity of local institutions and national NGOs.

Commitment to use the outputs of the consultations: consultation of the affected people and different stakeholders is a time consuming process for these parties. Their involvement

and participation level will depend on the commitment of the project proponent to use the results of the consultation for the project design. Therefore, the proponent must be convinced of the usefulness of consultations and he must give the process the needed credibility. The commitment of the proponent may be particularly important for power projects. Considering that these big projects are decided at a national or regional level, local populations might have the feeling that major decisions and the project design have already been finalized by the project proponents.

Identification of responsibilities: in the planning process of a project, the responsibilities for undertaking the consultations and producing the outputs must be clearly defined at each stage of the project. When national regulations require the implication of specific institutions or agencies in the public consultations, these institutions must be identified and involved in the whole process. In the case of transboundary projects such as transmission lines, more than one agency may be involved in the public consultation plan. Therefore, coordination of these agencies and definition of their own responsibilities must be clearly stated to avoid overlapping.

Provision for adequate resources: Consulting the stakeholders of a project involves specialized skills, financial resources and time. The cost of the consultation activities must be fully evaluated and incorporated in the budget of the project planning and implementation. Fees for consultation activities should take into account a whole set of factors. For instance, rural area where affected people are dispersed such as in a transmission line project, tend to make consultations more difficult and costly. Prior information of the population before consultation sessions will also be more costly if affected people are illiterate. Illiteracy prevents from the use of printed documents. Therefore, it entails information methods which are more expensive than the distribution of a report. Inaccessibility of the area and poor communications will add to the costs. Cultural factors in affected communities notably restrictions on women involvement during public consultations, might involve holding distinct sessions for men and women. These will also add to the costs. If the population's past experience with different projects proponent has been fairly negative or if affected communities are likely to be worry, as it might be the case with a big dam project or a thermal power project, the consultation strategy will need to include much more information sessions and trust-building mechanisms. Such context will require the intervention of very skilled professionals, necessitate additional activities and involve extra costs.

The NBI power projects will require trans-boundary EIA and consultation process. A trans-boundary public participation involves supplementary time, resources and costs since it engages several responsible authorities, different sets of stakeholders, institutional and cultural differences, language barriers, etc. In addition, the country of origin of impacts and the country of impacts being different, the issues for which the consultation is needed will vary from one country to another. Therefore, the strategy will require country-specific methods and tools.

Planning the consultation process

The planning of the consultation process will consider the different issues highlighted above and will conduct the following tasks:

- Identification of all stakeholders groups;
- Identification of the issues for which the consultation is needed;
- Identification of the historical and social environment and, the site-specific sensitivities and decision making process of the communities to be consulted;
- Selection of consultation techniques and tools;
- Definition of a communication strategy;
- Identification of the professionals required;
- Elaboration of a schedule;
- Preparation of a budget.

Throughout the EA process and reports, the consultation sessions should be well documented. Reports shall include: a description of the methodology used, the name of the attendees, a presentation of information gathered, topics of discussion and outcomes, recommendations on how the project might address the issues raised during consultation sessions including the mitigation measures suggested by the attendees, recommendations for on going consultations during the monitoring of the project.

The budget for consultation exercises during the EA process varies according to the type, the scope and the extent of the project. The World Bank estimates that this budget represents approximately 0.0025% of total project costs (World Bank, Environmental Assessment source book Update, Public consultation in the EA process: A strategic approach, May 1999, p.11).

3. Techniques and tools for consultation

Consultation of the populations during the EA process involves: 1) conveying information to the population; 2) listening to the population's opinions; 3) involving the population in decision making.

Conveying information may be done thru different techniques and tools: printed material (reports, brochures, etc.), displays and exhibits, newspapers, electronic media (television, radio and video), advertising, formal information sessions, informal information sessions such as field visits. All of them have advantages and disadvantages; they should be chosen after analysis of the social context of the project.

Listening to the population's opinions can be conducted thru surveys, focus groups, interviews with community advocates, public seminars, and large public meetings. Most of the time, a combination of these techniques is used. For instance, formal surveys using questionnaires will give statistically representative results to access the views of the majority on such issues as preferences for relocation sites in case of a resettlement entailed by the construction of a power plant. Nonetheless, focus groups with women might be a proper technique to take into account demand-side considerations while assessing a power project impact.

Involving the population in decision making especially in high profile projects such as power projects is a complex process. The principle techniques used are:

- Setting up tasks committees as advisory groups;
- Problem-solving techniques such as brainstorming with selected participants;
- Consensus-building techniques such as negotiations and mediation;
- For conflicting parties, arbitration based on employing an impartial mediator agreed upon by the parties.

Depending on the project, the stage of planning or implementation, the nature of stakeholders, the level of the involvement of the population in the decision making and the approach, these techniques and tools will be selected and adapted.

APPENDIX 4

Content of an environmental screening form

CONTENT OF AN ENVIRONMENTAL SCREENING FORM [20]

1. General information

a) Project proponent.

b) Name and address of the contact technical officer .

c) Name of the power project.

d) Location of the project.

2. Description and justification of the project

a) Description of the project:

Nature and location of the power project area; area that may be beneficially or adversaly affected by the project; characteristics of the project design; activities to be undertaken during the construction and operation of the project; materials needed for construction and inputs required for operation; manpower.

b) Planning of the project:

Relevance of the project in the Nile Basin countries power plan.

Environmental planning activities of the project in order to minimise its environmental and social impacts (ex. involuntary resettlement) and optimise the site location.

c) Justification of the project:

Current situation of the power sector, problems or needs to address and constraints of implementing the project.

d) Attached documents (feasibility study, detailed design study, etc.)

3. Environmental and social issues of the project

a) Brief description of the environmental and social components in the project area: ambient air, water, soils, vegetation, wildlife, population, socio-economic and sanitary conditions, economic activities, land use, cultural aspects.

b) Discussion on the following issues and the project:

- Proximity to critical natural habitat (primary forest, wetland, etc.) or protected area.
- Resettlement, expropriation of agricultural or forest lands, restricted access to this land and to revenues from their exploitation.
- Presence of indigenous communities.
- Proximity to cultural heritage sites, such as cemetery, archaeological and/or historical site, etc.

[20] Form to be filled in by the Regional Environmental Assessment Working Group (REAWG)

- Deforestation.
- Other anticipated important impacts: significant adverse transboundary impacts; consumption of water and other natural resources; hazardous waste generated by the project, impacts on vulnerable groups, economic and social benefits to the local community, the nation and neighbouring countries.

c) Actions proposed to minimize the environmental and social impacts of the project.

4. Other relevant information

Indicate any other relevant information related to the project, such as public consultations and other studies already conducted, etc.

5. Project environmental category and justification (SN)

a) Project category: A, B or no funding.

b) Justification.

6. World Bank safeguard policies triggered by the project

On the basis of the environmental and social issues of the project, indicate the safeguard policies of the World Bank that will be triggered by the power project:

- OP 4.01: Environmental Assessment
- OP 4.04: Natural Habitats
- OP 4.10: Indigenous Peoples
- OP 4.11: Cultural Property
- OP 4.12: Involuntary Resettlement
- OP 4.37: Safety of Dams
- OP 7.50: International Waterways

7. Documents required to be prepared

According to the project environmental category and policies triggered by the project, identify the documents required to be prepared for the project:

- Environmental impact assessment (EIA)
- Environmental and social management plan (ESMP)
- Environmental audit
- Risks assessment
- Resettlement action plan (RAP)
- Dam safety measures
- Other relevant document (indigenous community plan, cultural property plan etc.)

APPENDIX 5

Typical TOR for the EIA of category A power projects

TYPICAL TOR FOR THE EIA OF CATEGORY A POWER PROJECTS

This appendix describes the typical contents of Terms of Reference for the environmental impact assessment of a power project screened as Category A project according to this EA framework.

a) Introduction

This first section of the TOR indicates the purpose of the TOR, identifies the project proponent, the contact technical officer and the consultant mandated to prepare the TOR and the EIA, briefly describes the type of power project (hydropower, thermal, geothermal and/or transmission line) to be assessed and explains the arrangements made at this stage to undertake the EIA.

b) Context

This section explains the institutional, geographical, environmental, social and economic context in which the power project is to take place. Moreover, it provides sufficient information on the objectives and components of the project, as well as on the study area, so that any person interested in the project can understand the situation and constraints surrounding the project and the EIA to be carried out. Also, it shall mention any source of information (documents such as Country Environmental Profiles and Poverty Reduction Strategy Papers) that could be useful for the completion of the EIA.

c) Requirements

This section indicates which policies and guidelines must be followed in carrying out the EIA. Among others, those can include:

- Environmental and social policies of the project country of origin;
- Environmental and social policies of the country impacted in case of significant adverse transboundary impacts;
- Funding agency's applicable environmental and social policies;
- Relevant international environmental/social agreements ratified by the project country of origin.

d) Objectives and Scope of Work

This section defines the objectives of the EIA and summarises the scope of work to carry out, by indicating the key tasks to undertake during the study. The scope and level of work involve in the preparation of the EIA shall be proportional to the project's potential impacts. For instance, an EIA for a project that would likely have major adverse impacts on social components but limited impacts on the environment should focus mainly on the affected social components.

Major tasks that shall be highlighted in this section because of their importance in the preparation of an EIA include:

- Describing and justifying the proposed project by providing a synthetic description of the national power sector and project relevant components and presenting appropriate maps plans and figures.
- Identifying the policy, legal and administrative framework relevant to the project.
- Defining and justifying the project study area for the assessment of environmental and social impacts; in case of significant adverse transboundary impacts, include the concerned impacted territory in the project study area.
- Describing and analysing the physical, biological and human environment conditions in the study area before project implementation. This analysis shall include the relevant environmental and social components, especially those of important value for the society and local populations.
- Presenting and analysing other power alternatives to the proposed project, including the "without project" option, by identifying and comparing the alternatives on the basis of technical, economic, environmental and social criteria.
- For the selected alternative, identifying and assessing potential importance of beneficial and adverse environmental and social, direct and indirect, short and long-term, temporary and permanent impacts, on the basis of a rigorous scientific method.
- Defining appropriate measures to prevent, minimise, mitigate, or compensate for adverse impacts or to enhance the project environmental and social benefits, including responsibilities and associated costs.
- Addressing potential cumulative effects taking into account other initiatives planned in the study area.
- Defining appropriate environmental and social monitoring measures, including indicators, institutional responsibilities and associated costs.
- As appropriate, preparing an environmental emergency plan including an analysis of the risk of accident, the identification of appropriate safety measures and the development of a preliminary contingency plan.
- Preparing a resettlement plan, if necessary.
- Identifying institutional responsibilities and needs for capacity building if necessary to implement the recommendations of the environmental and social assessment.

- Carrying out consultations with primary and secondary stakeholders in order to obtain their views on and preoccupations about the project.
- Preparing the EIA Report according to the generic contents presented in this EIA framework.
- Preparing an Environmental and Social Management Plan (ESMP) according to the generic contents presented in this EIA framework.

e) Schedule

To be defined by the project proponent and agreed by the NEA(s).

f) Team of Experts and Level of Effort

This section identifies the experts who will be involved in the EIA and indicates, if possible, the level of effort estimated for each expert. The consultant's team shall include competent experts in the relevant environmental and social fields of expertise, such as water resources and health specialists when water management and health constitute key issues of the project.

g) Reporting

The EIA Report shall be presented in a clear and concise manner and focus on relevant and significant environmental and social issues that assist in understanding the project and its impacts. The scope and level of details of the Report shall be proportional to the project's potential impacts.

The EIA Report shall describe the methodology to carry out the studies. In particular, the models, methods and criteria used in the studies shall be presented and explained. The Report shall also include maps and plans at the appropriate scale and list all consulted documents.

APPENDIX 6

Involuntary resettlement

INVOLUNTARY RESETTLEMENT

This appendix comprises 3 parts:

1) Overall objectives and guidelines to prepare a resettlement instrument
2) Terms of reference for a full Resettlement Action Plan
3) Terms of reference for an abbreviated resettlement plan

PART I

OBJECTIVES AND GUIDELINES FOR A RESETTLEMENT PLAN

In undertaking the preparation of a resettlement instrument, the project proponents must achieve the following overall objectives:

A. When possible, avoid resettlements. At least, minimize the resettlements by exploring alternative project designs.
B. When it is not possible to avoid resettlements, enhance or at least restore the livelihoods and living standards of displaced or affected persons.
C. Consult displaced or affected people and give them opportunities to participate in the planning and implementation of the resettlement plan.

To comply with these objectives, the resettlement instruments will respect the following requirements:

1. The resettlement instruments will include measures to guarantee that the displaced or affected persons will:
    a. be informed on their rights and consulted on resettlement alternatives;
    b. be compensated before their displacement at full replacement cost for losses attributable to the project. The replacement cost shall not take into account the depreciation of the structures or assets and, it will covert all transaction costs;
    c. receive assistance in addition to compensations to make sure that their livelihoods and living standards are improved or at least restored. Assistance will vary: land preparation, training, etc.

2. If the resettlement involves physical relocation of the affected people, the resettlement instrument will include measures to:
    a. Assist the people during relocation;
    b. Provide housing or housing site, business premises or agricultural sites of locational advantage or productive potential at least equivalent of those of the pre-displacement sites.

3. When physical relocation is required, develop a strategy based on land replacement rather than cash compensation especially for the persons whose livelihoods are land-bases.

4. When physical relocation is required, compensate for the loss of access to community services or land holdings (grazing, gardening and fishing areas, substances for energy, etc) and public infrastructures or services (schools, health centers, markets, places of worship, water facilities, etc.) in order to restore or improve the accessibility and quality of the services.

5. When physical relocation is required, preserve the pre-existing communities pattern of social and cultural organization by involving the displaced and host communities in the relocation decisions.

6. When necessary after displacement, assist during a transition period the affected people to make sure they will restore their livelihood and living standards.

7. When planning the resettlement instrument, ensure that displaced and host communities are consulted and given opportunities to participate at each stage or the resettlement's preparation, implementation and monitoring.

8. When developing a resettlement instrument, always pay a particular attention to the specific needs of vulnerable groups among the affected persons. These groups must to be identified first. They can often be found amongst the poorest inhabitants, the landless peasants, women and children, displaced persons or refugees, households suffering from HIV/AIDS and, the indigenous peoples.

9. When the impacts of a project require the preparation of a full resettlement action plan (RAP) or an abbreviated resettlement plan, carry out a census in the project area where land acquisition is intended. The census will identify the affected persons who will be eligible for compensation including those who have no recognizable legal right or claim to the land they are occupying.

PART 2

TYPICAL TERMS OF REFERENCE FOR A FULL RESETTLEMENT ACTION PLAN

I. Background

The Nile Basin Initiative (NBI), through the Regional Power Trade Project (RPTP), has produced in 2008 a comprehensive standard framework for the integrated environmental and social impact assessment of regional power projects applicable in all NBI countries. Therefore, the impacts of regional power investment projects initiated in the Nile Basin countries need to be assessed using this framework in order to meet the national and international standards requirements in terms of environmental and socio-economic considerations.

Following the environmental screening of the project under study, it has been established that it will require land acquisition or restriction of access to resources. A Resettlement Action Plan (RAP) is required since this project entails involuntary resettlement for 200 or more severely affected persons.

II. Objective

The general objective of this consultancy is to elaborate a Resettlement Action Plan for the project under study. The RAP shall comply with NBI's EIA framework for regional power investment projects. The RAP shall also be developed as part of the EIA of the project. Accordingly, the consultant shall produce a document whose content will be harmonized with the EIA of the project.

III. Scope of work

The consultant shall prepare a RAP document covering the following subjects and among other things, perform the following tasks.

1. Description of the project and justification of the study

The consultant will give a general description of the project and its context. He will describe the project zone and provide a map or a plan of its location. He will present the size, position and limits of the potential expropriation area. With the relevant ministry, he will set out the cadastral situation of the area.

2. Identification of the project potential impacts

The consultant will identify the project components or activities that may result in the displacement of population. The term “displaced population” refers to persons who will be affected in any of the following ways:

- lost of their house or shelter;
- lost of their productive assets;
- lost of their income sources or means of livelihood.

For the impacts that can be located, the location of the impacts will be identified. When possible, the location will be positioned on a map or a plan.

The alternatives considered (and steps taken if any) to avoid or minimize the displacement of population will be presented and discussed.

3. Objectives of the resettlement action plan

The consultant will present the NBI requirements regarding involuntary resettlement instruments as figuring in its EIA framework for regional power investment projects. According to these requirements and in the light of the project potential impacts, the objectives of the resettlement action plan will be specified.

4. Socioeconomic studies

The consultant will carry out socio-economic studies including a census in the early stages of his assignment. To comply with the NBI requirements regarding resettlement plans, he will consult the potentially affected communities during these studies.

The census shall provide details of:

- Spatial distribution of the occupants;
- Nominative list of the current occupants of the affected area;
- Standard characteristics of the listed households: size of the household, gender, age and occupation of each member, gender of head of household, livelihoods (including if relevant and possible, production levels and income derived);
- Inventory of the affected houses or shelters (distinguishing owners and tenants);
- Inventory of the affected assets (lands, fruit-trees, businesses, etc);
- Identification of the different category of affected people according to their different type of rights on the land they are occupying;
- Inventory of community or public services, infrastructures and collective holdings (grazing, gardening and fishing areas, schools, health centers, markets, places of

worship, wells, graveyards, etc.): the ones situated in the area and the ones out of the area for which the access will be lost if the people are displaced.

The other studies shall provide baseline information on:

- Characteristics of the affected communities: demography, social and households organization, housing and living standards, production systems (agriculture, stockbreeding, fishing, handcraft, trading and business, forest, natural and common property resources used for livelihood and sustenance, etc.),health status, education, cultural characteristics, religion or beliefs, position, situation and activities of women, formal and informal institutions present in the area or involved in the communities (community organizations, NGOs, women associations, etc).
- Vulnerable groups in the affected communities: identification of the groups, estimation of the number of persons, assessment of their specific needs, valuation of the provision that shall be needed to meet those specific needs if the persons are displaced.
- Patterns of social interaction in the affected communities: social networks and social support systems, how they will be potentially affected, what measures need to be taken to maintain the existing interactions, etc.
- Land tenure and transfer systems including the customary systems and any issues raised by different tenure systems in the project area

5. Legal and institutional framework

The consultant will describe and analyse the legal framework for the resettlement and compensation of persons to be displaced:

- Laws (including customary law and traditional usage) governing law tenure, valuation of assets and losses, compensation and natural resources usage rights.
- Applicable national laws and administrative procedures in case of expropriation and displacement of population.
- Judicial process and the timeframe for the procedures.
- Scope, nature and rates of compensations in case of expropriation.
- Methodology of valuation of the lost assets, mode of payment, dispute resolution mechanisms.
- Agencies responsible for expropriation and implementing resettlement (including an assessment of their institutional capacity to conduct those activities).
- Gaps, if any, between national laws and NBI requirements, and the mechanisms to bridge those gaps.

6. Eligibility criteria and cut-off date

The consultant will give a definition of the displaced persons in the context of the project. He will specify the criteria by which displaced persons will be deemed eligible for compensation or any other assistance. He will state the cut-off date after which persons who encroach the area won't be entitled to any form of compensation or assistance.

7. Valuation of and compensation for losses

The consultant will plan out the methodology for evaluation all the losses and determine their replacement cost. He will describe the compensations and other resettlement measures that will assist each category of eligible persons. The measures will be compatible with the cultural preferences of the affected persons which will have been identified by consulting them. The consultant will describe the types and levels of compensation for each type of losses.

He will prepare a resettlement entitlement matrix which will give a clear view of each different categories of:

- Project impacts;
- Affected populations/entities;
- Compensation measures;
- Complementary measures.

Complementary measures include those aimed to the vulnerable groups. Where a project is likely to have adverse impacts on households or individual belonging to vulnerable groups, the RAP should specify measures additional to the compensation measures.

An other matrix will give detailed information on the rates of compensation for each type of losses.

The matrixes will be used by the team in charge of the implementation of the resettlement plan. They should be user friendly in order to give clear and full answers to the following questions: Which type of compensation for a given loss? What rate for that specific compensation?

Based on the results of the socioeconomic studies particularly those of the census, the consultant will proceed to the evaluation of all the expected losses - either total or partial, permanent or temporary- and of their replacement cost.

8. Consultation and community participation

During RAP preparation, the consultant shall hold consultations with potentially affected populations, local authorities (including traditional authorities) and when possible, with host communities. The consultation will examine among other things:

- Conditions under which the resettlement will be socially acceptable;
- Measures required to guarantee that the affected people will enhance or at least restore their livelihoods and living standards;
- Preferences regarding forms of compensation and resettlement assistance;
- Measures need to be taken to maintain the existing social networks and social support systems;
- Definition of criteria for the selection of relocation sites and when possible, choice of specific sites;
- Measures to mitigate impacts of resettlement on host communities and arrangements for addressing conflicts that may occur between resettlers and host communities;
- Institutional and organizational arrangements by which displaced people can communicate their concerns to project authorities and participate throughout planning, implementation and monitoring of the RAP.

The view expressed and the results of the consultations shall be summarized and annexed to the PAR. The view expressed shall be taken into account in the design of the RAP.

The consultant will also describe the strategy for consultation and community participation of affected people and host communities throughout the preparation and implementation of the resettlement activities.

9. Grievance procedures

The consultant will propose grievance mechanisms and procedures that should be used for third-party settlement of disputes that may arise from resettlement. These procedures should be affordable and accessible for the affected people. They should also be based on existing judicial recourses and traditional mechanisms for dispute settlement.

10. Organizational responsibilities

The consultant will propose an organizational framework for implementing the RAP. The proposition should be based on the existing institutional framework if any exist. The proposition will integrate the institutional and organizational arrangements for community participation. Any measure (including technical assistance) required to strengthen the capacity of implementation agencies' and community institutions should be identified. Provisions for those measures should be valuated. Provisions for the transfer of responsibilities to local authorities or displaced and host communities themselves should also be taken into account when appropriate. These provisions should be included in the cost estimates for implementation of the RAP.

11. Implementation activities

The consultant will describe the different steps and activities that shall be conducted to carry out the RAP from preparation through implementation. Without restricting to compensation process, it will notably detail this process explaining for instance the following measures:

- If necessary, updating of the census;
- Disclosure and validation of the list of persons deemed eligible for compensation;
- Disclosure of the valuation of individual and community losses and compensations;
- Negotiation for each individual record with the affected person or household;
- Negotiation for community compensations;
- Reconstruction of assets and/or payment of cash compensation;
- Physical displacement and resettlement;
- Assistance to displaced persons notably to vulnerable groups.

12. Relocation site selection

Based on the consultation of population and technical considerations such as locational advantage or productive potential, the consultant will review the suitability of different relocation sites. He will specify the site selection criteria. He will identify preliminary relocation options. If applicable, he will provide socioeconomic datas regarding host population. He will list the activities that shall be undertaken for the selection of relocation sites during the early stages of implementation of the RAP.

13. Schedule and budget

The consultant will propose a schedule covering all defined activities from preparation through implementation. The schedule will indicate how the resettlement activities are linked to the implementation of the project and tied to overall sub-project timetable.

He will prepare detailed cost estimates for preparation and implementation of the PAR including monitoring activities and administrative overheads. The budget will include a detailed estimation of aggregate costs for each type of asset losses and compensation. If for instance the area covers many villages, the costs will be broken up by village.

14. Monitoring and evaluation

The consultant will describe the mechanisms and arrangements for monitoring and evaluating of the resettlement activities. Among other things for the monitoring, he will define:

- Method of monitoring and responsibilities;
- Performance monitoring indicators to measure outputs and outcomes of activities;
- For each indicator, data to be collected, instrument, periodicity and responsible unit.

He will also give indications on the method and indicators for an evaluation of the impact of resettlement after all resettlement and related development activities have been achieved.

IV. Delivrables

Unless otherwise specified, the documents shall be written in English and shall include:

1. At the early stage of the assignment, a paper on the methodology for socioeconomic studies notably for the census: the questionnaire, the census tactic plan to cover the area, the public information strategy, the team, etc. These instruments shall be discussed and approved before the beginning of the census.
2. A preliminary RAP document complying with NBI's EIA framework for regional power investment projects. Among others, the document shall contain all the points covered by the above scope of work and the following appendices:
   - Detailed results of the census including the methodology, the nominative list of the current occupants of the affected area and their individual losses (per household or when relevant, per person).
   - Report on the consultation summarizing the expressed views and including a nominative list of participants.
3. After production of a preliminary RAP, the consultant will hold consultation sessions with affected people to present the content of the RAP and its guiding principles. He will get their feedback and take into account the expressed concerns in the final RAP. A report of these consultation sessions will be annexed to the final document.
4. A final RAP document integrating comments of the NBI on the preliminary document and concerns of the population as expressed during consultation.

V. Reporting requirements

To be defined by the project manager.

VI. Expertise

The consultant shall have solid background and knowledge of international standards requirements for environmental impact assessments. In particular, the consultant shall:

- Demonstrate practical experience exceeding 10 (ten) years in conducting social assessments in developing countries, preferably in African and in the Nile Basin countries.

- Have solid experience in developing resettlement plans complying with the World Bank 4.12 safeguard policy concerning involuntary resettlement preferably in Africa and in the Nile Basin countries.
- Have solid experience in conducting socioeconomic studies in general and census in particular preferably in Africa and in the Nile Basin countries.
- Demonstrate experience in carrying out EIA for power projects.
- Demonstrate experience in dealing with environmental protection, gender, vulnerable groups and poverty reduction issues in development projects.

VII. Timing

To be defined by the project manager.

VIII. Supervision

To be defined by the project manager.

IX. Facilities provided by the client

To be defined by the project manager.

PART 3

TYPICAL TERMS OF REFERENCE FOR AN ABBREVIATED RESETTLEMENT PLAN

I. Background

The Nile Basin Initiative (NBI), through the Regional Power Trade Project (RPTP), has produced in 2008 a comprehensive standard framework for the integrated environmental and social impact assessment of regional power projects applicable in all NBI countries. Therefore, the impacts of regional power investment projects initiated in the Nile Basin countries need to be assessed using this framework in order to meet the national and international standards requirements in terms of environmental and socio-economic considerations.

Following the environmental screening of the project, it has been established that the project will require land acquisition or restriction of access to resources. The scoping of the project has highlighted that there is no need for a full Resettlement Action Plan (RAP) since this project does not entail involuntary resettlement for 200 or more severely affected persons. An abbreviated resettlement plan (ARP) will be sufficient.

II. Objective

The general objective of this consultancy is to elaborate an abbreviated resettlement plan for the project under study. The plan shall comply with NBI's EIA framework for regional power investment projects. The plan shall also be developed as part of the EIA of the project. Accordingly, the consultant shall produce a document whose content will be harmonized with the EIA of the project.

III. Scope of work

The consultant shall prepare an abbreviated resettlement plan document covering the following subjects and among other things, perform the following tasks.

1. Description of the project and justification of the study

The consultant will give a general description of the project and its context. He will describe the project zone and provide a map or a plan of its location. He will present the size, position

and limits of the potential expropriation area. With the relevant ministry, he will set out the cadastral situation of the area.

2. Identification of the project potential impacts

The consultant will identify the project components or activities that may result in the displacement of population. The term “displaced population” refers to persons who will be affected in any of the following ways:

- lost of their house or shelter;
- lost of their productive assets;
- lost of their income sources or means of livelihood.

For the impacts that can be located, the location of the impacts will be identified. When possible, the location will be positioned on a map or a plan.

The alternatives considered (and steps taken if any) to avoid or minimize the displacement of population will be presented and discussed.

3. Objectives of the abbreviated resettlement plan

The consultant will present the NBI requirements regarding involuntary resettlement instruments as figuring in its EIA framework for regional power investment projects. According to these requirements and in the light of the project potential impacts, the objectives of the abbreviated resettlement plan will be specified.

4. Census

The consultant will carry out a census in the early stages of his assignment. To comply with the NBI requirements regarding resettlement plans, he will consult the potentially affected communities during the census.

The census shall provide details of:

- Spatial distribution of the occupants;
- Nominative list of the current occupants of the affected area;
- Standard characteristics of the listed households: size of the household, gender, age and occupation of each member, gender of head of household, livelihoods (including if relevant and possible, production levels and income derived);

- Inventory of the affected houses or shelters (distinguishing owners and tenants);
- Inventory of the affected assets (lands, fruit-trees, businesses, etc);
- Identification of the different category of affected people according to their different type of rights on the land they are occupying;
- Inventory of community or public services, infrastructures and collective holdings (grazing, gardening and fishing areas, schools, health centers, markets, places of worship, wells, graveyards, etc.): the ones situated in the area and the ones out of the area for which the access will be lost if the people are displaced.

5. Valuation of and compensation for losses

The consultant will plan out the methodology for evaluation all the losses and determine their replacement cost. He will describe the compensations and other resettlement measures that will assist each category of eligible persons. The measures will be compatible with the cultural preferences of the affected persons which will have been identified by consulting them. The consultant will describe the types and levels of compensation for each type of losses.

He will prepare a resettlement entitlement matrix which will give a clear view of each different categories of:

- Project impacts;
- Affected populations/entities;
- Compensation measures;
- Complementary measures.

Complementary measures include those aimed to the vulnerable groups. Where a project is likely to have adverse impacts on households or individual belonging to vulnerable groups, the abbreviated resettlement plan should specify measures additional to the compensation measures.

An other matrix will give detailed information on the rates of compensation for each type of losses.

The matrixes will be used by the team in charge of the implementation of the resettlement plan. They should be user friendly in order to give clear and full answers to the following questions: Which type of compensation for a given loss? What rate for that specific compensation?

Based on the results of the census, the consultant will proceed to the evaluation of all the expected losses - either total or partial, permanent or temporary- and of their replacement cost.

6. Consultation and community participation

During ARP preparation, the consultant shall hold consultations with potentially affected populations. The consultation will examine among other things:

- Acceptable alternatives;
- Conditions under which the resettlement will be socially adequate;
- Measures required to guarantee that the affected people will enhance or at least restore their livelihoods and living standards;
- Preferences regarding forms of compensation and resettlement assistance;
- Measures to mitigate impacts of resettlement and arrangements for addressing conflicts that may occur between resettlers and host communities;
- Institutional and organizational arrangements by which displaced people can communicate their concerns to project authorities and participate throughout planning, implementation and monitoring of the ARP.

The view expressed and the results of the consultations shall be summarized and annexed to the resettlement plan. The view expressed shall be taken into account in the design of the plan.

The consultant will also describe the strategy for consultation and community participation of affected people throughout the preparation and implementation of the resettlement activities.

7. Institutional responsibilities for implementation of the plan and grievance procedures

The consultant will describe the legal and institutional framework for the resettlement and compensation of persons to be displaced:

- Laws (including customary law and traditional usage) governing law tenure, valuation of assets and losses, compensation and natural resources usage rights;
- Applicable national laws and administrative procedures in case of expropriation and displacement of population;
- Judicial process and the timeframe for the procedures;
- Range of the power of the national eminent domain;
- Scope, nature and rates of compensations in case of expropriation;
- Methodology of valuation of the lost assets, mode of payment, dispute resolution mechanisms;
- Agencies responsible for expropriation and implementing resettlement (including an assessment of their institutional capacity to conduct those activities);

- Gaps, if any, between national laws and NBI requirements, and the mechanisms to bridge those gaps.

The consultant will propose an organizational framework for implementing the abbreviated resettlement plan. The proposition should be based on the existing institutional framework if any exist. The proposition will integrate the institutional and organizational arrangements for community participation.

The consultant will propose grievance mechanisms and procedures that should be used for third-party settlement of disputes that may arise from resettlement. These procedures should be affordable and accessible for the affected people. They should also be based on existing judicial recourses and traditional mechanisms for dispute settlement.

8. Implementation and monitoring activities

The consultant will describe the different steps and activities that shall be conducted to carry out the abbreviated resettlement plan from preparation through implementation. Without restricting to compensation process, it will notably detail this process explaining for instance the following measures:

- If necessary, updating of the census;
- Disclosure and validation of the list of persons deemed eligible for compensation;
- Disclosure of the valuation of individual and community losses and compensations;
- Negotiation for each individual record with the affected person or household;
- Negotiation for community compensations;
- Reconstruction of assets and/or payment of cash compensation;
- Physical displacement and resettlement;
- Assistance to displaced persons notably to vulnerable groups.

The consultant will describe the mechanisms and arrangements for monitoring the resettlement activities. Among other things, he will define:

- Method of monitoring and responsibilities;
- Performance monitoring indicators to measure outputs and outcomes of activities;
- For each indicator, data to be collected, instrument, periodicity and responsible unit.

9. Schedule and budget

The consultant will propose a schedule covering all defined activities from preparation through implementation. The schedule will indicate how the resettlement activities are linked to the implementation of the project and tied to overall sub-project timetable.

He will prepare detailed cost estimates for preparation and implementation of the abbreviated resettlement plan including monitoring activities and administrative overheads. The budget will include a detailed estimation of aggregate costs for each type of asset losses and compensation.

IV. Delivrables

Unless otherwise specified, the documents shall be written in English and shall include:

1. At the early stage of the assignment, a paper on the methodology for the census: the questionnaire, the census tactic plan to cover the area, the public information strategy, etc. These instruments shall be discussed and approved before the beginning of the census.
2. A preliminary abbreviated resettlement plan complying with NBI's EIA framework for regional power investment projects. Among others, the document shall contain all the points covered by the above scope of work and the following appendices:
   - Detailed results of the census including the methodology, the nominative list of the current occupants of the affected area and their individual losses (per household or when relevant, per person).
   - Report on the consultation summarizing the expressed views and including a nominative list of participants.
3. After production of a preliminary resettlement plan, the consultant will hold a consultation session with affected people to present the content of the plan and its guiding principles. He will get their feedback and take into account the expressed concerns in the final plan. A report of this consultation session will be annexed to the final document.
4. A final abbreviated resettlement paln document integrating comments of the NBI on the preliminary document and concerns of the population as expressed during consultation.

V. Reporting requirements

To be defined by the project manager.

VI. Expertise

The consultant shall have solid background and knowledge of international standards requirements for environmental impact assessments. In particular, the consultant shall:

- Demonstrate practical experience exceeding 5 (five) years in conducting social assessments in developing countries, preferably in African and in the Nile Basin countries.
- Have solid experience in developing resettlement plans complying with the World Bank 4.12 safeguard policy concerning involuntary resettlement preferably in Africa and in the Nile Basin countries.
- Have solid experience in conducting socioeconomic studies in particular preferably in Africa and in the Nile Basin countries.
- Demonstrate experience in carrying out EIA.
- Demonstrate experience in dealing with environmental protection, gender, vulnerable groups and poverty reduction issues in development projects.

VII. Timing

To be defined by the project manager.

VIII. Supervision

To be defined by the project manager.

IX. Facilities provided by the client

To be defined by the project manager.

APPENDIX 7

Indigenous peoples

INDIGENOUS PEOPLES

This appendix comprises 2 parts:

1. The content of an indigenous peoples social assessment
2. Terms of reference for an Indigenous Peoples Plan (IPP)

PART 1

CONTENT OF AN INDIGENOUS PEOPLES SOCIAL ASSESSMENT

If based on the screening, it as been established that indigenous peoples are present in the project area or have collective attachment to it, it is mandatory to undertake a social assessment to:

- Evaluate the project's potential impacts on the indigenous communities;
- Examine project's alternative to avoid significant adverse affects on these communities especially their physical relocation;
- If alternatives can not totally avoid involuntary restrictions or resettlement, engage in free, prior and informed consultation with indigenous communities.

The indigenous peoples social assessment will cover the following items:

- The description of the legal and institutional framework applicable to indigenous peoples in the country.
- A baseline social study of the characteristics of the affected indigenous peoples: limits of the lands traditionally used or occupied, demographics, internal social organization, gender and intergenerational relations, economic activities notably the natural resources on which the peoples' economy is based, civic rights and position in the society, groups with which they have relations, housing, health, education, cultural features, religious beliefs, etc.
- An analysis of the vulnerability of the affected peoples for instance their traditional ties to the land, their dependence to the land and natural resources from which they live, the absence of legal or recognized rights on the land they use, etc.
- The identification of key stakeholders for consultation and the definition with them of a culturally appropriate consultation process throughout project preparation and implementation. The consultation framework will be gender and intergeneration inclusive. Stakeholders will include the affected communities, the indigenous organizations if any exist, and NGO or social society organizations suggested by the indigenous communities.
- A detailed identification of the potential negative and positive effects of the project on the affected indigenous peoples based on their free, prior and informed consultation.
- With the affected peoples, an identification of: i) the alternatives to avoid negative impacts; ii) the mitigation measures to minimize or compensate in a culturally appropriate manner for the unavoidable adverse impacts and; iii) an identification of the measures to ensure that they will benefit from the project.

Consultation and participation of the indigenous communities will be central in the process of conducting the social assessment. The affected communities shall receive all relevant information about the project and its potential impacts in a culturally appropriate manner.

Culturally appropriate methods shall be used to ensure their participation and consultation. The process, the view expressed and the results of the consultations will be documented. It will figure as an appendix to the social assessment report.

The social assessment report shall be disclosed to the affected indigenous peoples in an appropriate form, manner and language.

The social assessment must provide the project proponent all information to determine whether or not the affected indigenous communities give a broad support to the project. Such a support will be a condition to proceed with the project. If such a support is confirmed and the project planning is carried on, the project proponent will need to elaborate an Indigenous Peoples Plan (IPP). The IPP will specify the measures required to ensure that indigenous peoples receive social and economic benefits from the project. The proposed measures will be detailed and their cost will be budgeted for. The IPP will be integrated in the project design.

PART 2

TERMS OF REFERENCE FOR AN INDIGENOUS PEOPLES PLAN (IPP)

I. Background

The Nile Basin Initiative (NBI), through the Regional Power Trade Project (RPTP), has produced in 2008 a comprehensive standard framework for the integrated environmental and social impact assessment of regional power projects applicable in all NBI countries. Therefore, the impacts of regional power investment projects initiated in the Nile Basin countries need to be assessed using this framework in order to meet the national and international standards requirements in terms of environmental and socio-economic considerations.

Following the environmental scoping of the project under study, it has been established that the project will require land acquisition or restriction of access to resources that will affect indigenous peoples. Indigenous people live in the project area and/or have collective attachment to geographically distinct habitats or ancestral territories and to the natural resources in these habitats and territories in the project area.

A social assessment of the indigenous peoples' communities, based on free, prior and informed consultation with the affected communities has been conducted during project preparation. It provided details on the potential adverse impacts of the project. Unfortunately, avoidance of some of these impacts is not feasible. Provided that the indigenous communities will receive their share of the benefits and that they will be compensated for the adverse effects, they have given a broad community support to the project. Therefore, it has been established the need for an Indigenous Peoples Plan (IPP) to ensure that indigenous peoples receive social and economic benefits from the project.

II. Objective

The general objective of this consultancy is to elaborate an Indigenous Peoples Plan (IPP) for the project under study. The IPP shall comply with NBI's EIA framework for regional power investment projects. The IPP shall also be developed as a part of the planning process of the project notably as result of the social assessment and the consultation already held with the indigenous peoples. Accordingly, the consultant shall produce a document whose content will be integrated in the design of the project.

III. Scope of work

The consultant shall prepare an IPP document covering the following subjects and among other things, perform the following tasks.

1. Description of the project and justification of the study

The consultant will give a general description of the project and its context. He will describe the project zone and provide a map or a plan of its location. He will present the size, position and limits of the area where indigenous people live in or have collective attachment.

2. Identification of the project potential impacts

Based on the results of the social assessment, the consultant will recall the project components or activities that may result in adverse impacts on the indigenous peoples' communities.

For the impacts that can be located, the location of the impacts will be identified. When possible, the location will be positioned on a map or a plan.

The alternatives considered (and steps taken if any) to avoid or minimize the adverse impacts on the indigenous peoples will be presented.

3. Objectives of the Indigenous Peoples Plan (IPP)

The consultant will present the NBI requirements regarding indigenous peoples as figuring in its EIA framework for regional power investment projects. According to these requirements and in the light of the project potential impacts, the consultant will specify the objectives of the IPP.

4. Scope of the IPP

Consultations have been conducted with the indigenous peoples during the social assessment of the project. However, the consultant will conduct deepened consultations in order to elaborate the IPP. Thru these consultations and researches he will conduct, the consultant will set out the measures through which the project will make sure that:

- Indigenous affected peoples will receive culturally appropriate social and economic benefits from the project;

- The identified adverse impacts on the indigenous peoples will be minimized and compensated.

The consultant will prepare the IPP in a flexible manner so adjustments can be made during its implementation to ensure an iterative approach including the affected communities. In all cases, the consultant will ensure that benefits and compensations to the indigenous communities shall be given in culturally appropriate manners.

The IPP will be integrated into the project design documents. Therefore, the proposed measures shall be detailed and their cost shall be budgeted for.

Elaborating the IPP, the consultant will pay special attention to two specific considerations: i) lands and related natural resources; ii) commercial development of natural and cultural resources.

i. Lands and related natural resources

The IPP will pay attention to: a) the patterns of long-time traditional land and resources usage by the indigenous community including seasonal and cyclical usage rather than legal rights on these sites; b) the need to protect such sites against prohibited intrusion especially if traditional occupation or usage, or access to the natural resources of the sites, are essential to the sustainability of the livelihood of the indigenous community; c) the cultural and spiritual usage of the sites by the indigenous community since they may be important for the sustainability of their culture; d) the traditional knowledge and practices of the indigenous community for the management of the natural resources of the sites since their holistic view of the environment supports long-term development sustainability.

In some cases, the project activities may involve the establishment of legal rights on lands traditionally used by indigenous communities. In this case, the IPP shall include measures for legal recognition of the indigenous communities' long-term custody or usage rights on these lands.

ii. Commercial development of natural and cultural resources

In some cases, the project may involve the commercial development of natural resources located on lands traditionally owned, occupied or used by indigenous communities. In such cases, the IPP must include measures to enable indigenous peoples to share fairly in the

benefits to be made from the commercial development. At a minimum, they will receive benefits equivalent to those to which they would be entitled if they had legal ownership titles on the affected site.

In some other cases, the project may involve the commercial development of the indigenous communities' cultural resources and traditional knowledge. In such cases, the IPP must reflect the free, prior and informed consultation of the concerned communities and their agreement for such development. The IPP must include measures to ensure that the concerned people receive an equitable share of the benefits derived from the commercial development of their cultural resources and knowledge.

5. Consultation and participation of the indigenous communities

During IPP preparation, the consultant shall hold consultations with potentially affected indigenous communities. He will use culturally appropriate consultation methods: use of indigenous language during sessions, holding the sessions in an appropriate place and at an appropriate moment to allow wide participation, allowing sufficient time for meetings and discussions, etc.

After elaborating a draft report for the IPP, the consultant will present its content to the indigenous communities in an appropriate form and manner. He will verify that the IPP, as designed, receives a broad community support.

The view expressed and the results of the consultations will be summarized and annexed to the IPP. The view expressed shall be taken into account in the design of the final IPP document.

The consultant will also describe the strategy for consultation and community participation of indigenous communities throughout the preparation and implementation of the IPP.

6. Elements to be included in the IPP

The consultant will elaborate an IPP document including the following items:

i. A summary of the social assessment conducted at a previous stage in the project planning.
ii. A summary of the results of the consultation sessions held during the social assessment.

iii. A framework and guidelines to ensure appropriate consultation with the affected indigenous communities during the IPP implementation and more generally during the whole project implementation.

iv. An action plan of the identified measures which will ensure that indigenous affected peoples will receive culturally appropriate social and economic benefits from the project.

v. An action plan of the identified measures which will ensure that the identified adverse impacts on the indigenous peoples will be minimized and compensated.

vi. Appropriate grievance mechanisms and procedures that should be used for third-party settlement of indigenous peoples' claims that may arise during project implementation. These procedures should be affordable and accessible for the indigenous people. They should also be based on existing judicial recourses and traditional mechanisms for dispute settlement.

vii. Organizational framework for implementing the IPP. The proposition should be based on the existing institutional framework if any exist. The proposition will integrate the institutional and organizational arrangements for indigenous communities' participation. Any measure (including technical assistance) required strengthening the capacity of implementation agencies' and community institutions should be identified. Provisions for those measures should be valuated and included in the cost estimates for implementation of the IPP.

viii. Mechanisms and arrangements for monitoring and evaluating of the IPP. Among other things for the monitoring, the consultant will define:

- Method of monitoring and responsibilities.
- Performance monitoring indicators to measure outputs and outcomes of activities.
- For each indicator, data to be collected, instrument, periodicity and responsible unit.

The consultant will also give indications on the method and indicators for an evaluation of the impact of the IPP after all related activities have been achieved and the project completed.

ix. Budget and time-frame for the implementation of the IPP. The consultant will propose a schedule covering all defined activities from preparation through implementation. The schedule will indicate how the IPP activities are linked to the implementation of the project and tied to overall sub-project timetable. He will prepare detailed cost estimates for preparation and implementation of the IPP including monitoring activities and administrative overheads.

IV. Deliverables

Unless otherwise specified, the documents shall be written in English and shall include:

1. At the early stage of the assignment, a paper on the methodology for consultation and participation of the indigenous peoples affected by the project.
2. A preliminary IPP document complying with NBI's EIA framework for regional power investment projects. Among others, the document shall contain all the points covered by the above scope of work and the following appendix:
   - Report on the consultation summarizing the expressed views and including a nominative list of participants.
3. After production of a preliminary IPP, the consultant will hold consultation sessions with affected communities to present the content of the IPP and its guiding principles. He will get their feedback and take into account the expressed concerns in the final IPP. A report of these consultation sessions will be annexed to the final document.
4. A final IPP document integrating comments of the NBI on the preliminary document and concerns of the population as expressed during consultation.

V. Reporting requirements

To be defined by the project manager.

VI. Expertise

The consultant shall have solid background and knowledge of international standards requirements for environmental impact assessments and indigenous peoples issues. In particular, the consultant shall:

- Demonstrate practical experience exceeding 10 (ten) years in conducting social assessments in developing countries, preferably in African and in the Nile Basin countries
- Have solid experience in conducting socioeconomic studies and consultation sessions preferably in Africa and in the Nile Basin countries.
- Have experience in developing indigenous peoples plan or planning frameworks complying with the World Bank 4.10 safeguard policy concerning indigenous peoples
- Demonstrate experience in carrying out EIA for power projects
- Demonstrate experience in dealing with vulnerable groups, environmental protection, gender, and poverty reduction issues in development projects

VII. Timing

To be defined by the project manager.

VIII. Supervision

To be defined by the project manager.

IX. Facilities provided by the client

To be defined by the project manager.

APPENDIX 8

Accident Risk Management

ACCIDENT RISK MANAGEMENT

Power projects such as hydropower and thermal power projects can cause accidents with major consequences that can become transboundary. Therefore, the environmental assessment of Category A projects shall include an accident risk analysis. In all cases, the study shall describe the safety measures and a preliminary emergency plan for the construction and operation phases.

Before filling the reservoir of a hydropower project, the proponent shall submit the detailed operation, maintenance and security plans, indicating the repercussions on the river basin and safety of the population, upstream and downstream of the dam. This plan shall include all safety measures and describe how the dam operator will protect the population and the environment in case of major accident or unusual situation (climatic or other). The proponent shall comply with the dam policy of the funding agency, such as World Bank *OP 4.37: Safety on Dams*.

1. Risks of major accidents

The risk analysis of major accidents is based on the identification of hazards (hazardness of products, systems failure, sources of breaks, dams failure, etc.) from which accident scenarios are established. The analysis of previous accidents from similar projects in the last five to ten years provides additional information to establish the scenarios. All activities of the project shall be considered.

If the proponent can prove that the project is not likely to cause major accidents, the information gathered in the previous analysis can be used for the preparation of the emergency plan. In order to prove the absence of potential major accident, the proponent can use the concept of « worst-case scenario ».

If the proponent cannot prove the absence of potential major accident, the risk analysis shall continue by considering in details the hazards and ensuing accident scenarios in order to determine the related consequences and risks.

The analysis shall identify the elements of the natural and human environment that can be significantly sensitive to and affected by an accident (dwellings, hospitals, natural sites of interest, etc.). It shall also include the appraisal of the consequences related to the accident

scenarios. The objective of this task is to identify the areas within which the safety of the populations and the integrity of the biophysical and human environment can be affected, as well as the presence of sensitive elements previously identified. This information is also useful for emergency planning.

If there are sensitive elements in the areas that can be affected by an accident, the analysis also includes an estimate of the frequency of occurrence in order to establish the risks of the project. The risks can then be assessed according to their location from the project site.

Considering the characteristics of the dam and other structures of a hydroelectric complex, the proponent shall estimate the consequences of the dam failure, in order to identify the areas likely to be flooded and the populations and infrastructures that can be affected.

The study shall also include a brief analysis of external factors likely to cause major technological accidents on the project site. All natural (flood, earthquake, etc.) and human (neighbouring facility, train derailment, plane crash, etc.) events shall be considered. This information is integrated in the emergency planning.

2. Safety measures

The study shall describe the onsite and offsite safety measures. The following elements shall be described:

- Access restrictions to the site;
- Safety installations and prevention measures (systems of surveillance, emergency interruption, fire fighting, automatic extinguishers, emergency generators, leak detector, retention basin, safety distances, etc.);
- The mechanisms for detecting defective equipment;
- The storage of hazardous products.

3. Emergency plan

The study shall include a preliminary emergency plan enabling to adequately react in case of accident. This plan identifies the main actions to face a situation of accident. It describes the link with local authorities and alert mechanisms. If an emergency plan already exists in the area of the project, this plan should be updated to integrate the proposed power project.

In general, an emergency plan includes the following elements:

- The description of the accident scenarios as identified in the risks analysis: consequences, probability of occurrence, affected areas, etc.;
- The description of the various potential situations;
- The relevant information in case of emergency (responsible authorities, available equipment, plan of the site, safety equipment, etc.);
- The structure of intervention and the decision mechanisms of the organisation;
- The communication plan with the external civil security;
- The measures of intervention in case of spill, fire, explosion, etc.;
- The actions and sequence of interventions in case of emergency (emergency interruption, alert on the site, emergency call, evacuation, etc.);
- The measures of protection to protect the populations within the areas likely to be affected;
- The means to alert the populations that could be affected, in collaboration with local governmental authorities;
- The safety measures in force on the project site;
- The program to update and evaluate the emergency measures.

The proponent shall complete the comprehensive emergency plan before the project implementation.

APPENDIX 9

Examples of Sustainable criteria and CDM guidelines

EXAMPLES OF SUSTAINABLE CRITERIA AND CDM GUIDELINES

This appendix comprises 2 parts:

1. Tanzania SD Strategy
2. Kenyan Government Guidelines on the CDM

PART 1

TANZANIA SD STRATEGY

Source: Tanzania Strategy Profiles National Strategies for Sustainable Development, Planning Commission, http://www.nssd.net/country/tanzania/tz05.htm#1

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2. STRATEGIES WITH ECONOMIC EMPHASIS

2.1 Export Development Strategy and Action Plan

(A Dynamic strategy to Expand and Diversify Exports 2000 – 2004)

The Origin of the Idea

Taking into account Tanzania's low export supply response, the Government of Tanzania (URT) requested the World Bank to assist in preparing an Export Development Strategy and Action Plan as part of Economic Reform measures which started in 1986. The agreement was reached towards the end of 1994 and the exercise commenced in February 1995. The exercise was completed in June 1996.

2.1.2 Major Objectives of the Strategy

The major objective of Export Development Strategy and its action plan is to "*expand and diversify Tanzania Exports".*

2.1.3 Key Stakeholders involved in the Strategy

(a) Formulation

Planning Commission and Ministry of Finance, Ministry of Industries and Trade, Other 3 key ministries (Agriculture, Natural Resources and Tourism and Prime Minister's office), Bank of Tanzania (BOT).

The Private sector including representatives of exports, public and private sector institutions, donor community and multilateral financial institutions, academic & research institutions, local business community (regional and district representatives), regional representatives, and the media.

(b) Planning

Planning Commission, Ministry of Finance Bank of Tanzania, World Bank,

(c) Implementation, Management, Monitoring and Evaluation

(The strategy is not yet implemented)

2.1.4 Methodology/Process used to Formulate the Strategy

(i) A Task Force consisting of 15 senior Government and Private sector representatives worked with a joint World Bank/ED/Team to identify key export development constraints.

(ii) To deepen the Task Force understanding of the problems identified, specific studies were undertaken by special consultants in particular sectors such as garments, leather, tourism and customs. The main aim of engaging theses consultants was to dwell more deeply into these subsectors in order to identify opportunities for accelerating the pace of exports from these subsectors.

(iii) To understand how export problems have been solved in other countries, which are currently major exporters, the Task Force visited Thailand, Malaysia, Singapore and Mauritania.

(iv) Based upon the analysis undertaken in the foregoing phases, the task force then produced the first draft of the *"Export Development Strategy and Action Plan".*

The Task Force members and World Bank sought comments on the first draft from within and outside the Country through workshops and soliciting written comments. Within Tanzania, comments were sought at the regional level and by representatives of the public and private sector. Those comments were reviewed and reflected in the final document.

2.1.5 Current Status of Implementation of the Strategy

The strategy is at the early stage of implementation.

2.1.6 Major Problems during Strategy Formulation

A number of problems emerged during strategy formulation. These problems are presented below:-

1. Political support;
2. Financial constraint;
3. Inadequate donor support especially bilateral competing donors;
4. Vested interests of the lead institutions in export and investment (Interested in Status Quo situation – fear of change);
5. The strategy was not widely distributed (Voluminous and language used).

Three things will have to take place if the strategy is to be effectively implemented:-

1. political support from the beginning;
2. support from both bilateral and multilateral international development partners;
3. Need for participation of the general public and other government and private sector institutions in order to create awareness and ownership.

[…]

3. STRATEGIES DOMINATED BY SOCIAL PRIORITIES

3.1 Country Report on Implementation of the Beijing Platform for Action (Beijing + 5)

3.1.1 The Origin of the Idea

In 1946, the UN Commission on the Status of Women was established in order to facilitate the process of enhancing women's rights. The year 1975 was declared by the UN as the International Women's Year so as to focus public attention throughout the world, on the plight of women. The critical issues of women were then deliberated upon during the *Nairobi Forward Looking Strategies,* the Dakar and Beijing Conferences.

This report reviews the progress made in the implementation of the commitments undertaken by the Government of Tanzania at the *4th World Conference on Women* held in Beijing in 1995.

Following the Beijing Conference, the Government of Tanzania formulated and adopted an Action Plan known as the *National Sub-Programme for Women's and Gender Advancement* as part of the national strategy. This plan aims at implementing the Beijing Platform of Action within the framework of the Community Development Policy.

3.1.2 Major Objectives of the Strategy

The "*National Sub-Programme for Women's and Gender Advancement"* focuses on four out of the twelve critical issues raised at the Beijing Conference. These four areas of concern, which can be considered as broad development objects, are:

i. Enhancement of women's legal capacity;
ii. Economic empowerment of women and poverty eradication;
iii. Enhancement of Women's political empowerment and decision making.

Improvement of women's access to education, training and employment

3.1.3 Key Stakeholders involved in the Strategy

Various international organizations are involved in the implementation of the strategy. These include the United Nations Development Programme (UNDP), UNIFEM, World Bank, ILO, FAO, UNFPA, UNICEF, WFP, DFID, USAID, NORAD, CIDA, WHO, UNIDO, SIDA, DANIDA, GTZ, Royal Netherlands, Irish Aid, AIDOS (Italy), JOICIP, and FHI. National institutions and NGOs which are implementing the strategy include: VETA, EOTF, TGNP, TAMWA, KULEANA, TAWLA, FWETA and UMATI, WLAC, TAHEA, Women and Law in East Africa (T), and Plan International. At the grassroot level, the main stakeholders are the women.

3.1.4 Methodology/Process used to Formulate the Strategy

With respect to the enhancement of women's legal capacity, several methods or actions are being pursued as follows:

i. The review of laws which oppress women, and the enactment of new laws which give fair treatment to women. This includes review of the inheritance law, the marriage Act and child custody laws;
ii. To carry out legal literacy programmes and mass campaigns as a way of educating the public, both women and men alike, regarding their human rights. This includes teaching various issues related to women in the school curriculum and adult education programmes. In some cases para-legal training is offered to females;
iii. Steps are being taken to establish a *Commission on Human Rights in Tanzania* which would include the promotion of the rights of women;
iv. Since the Beijing Conference, the Government of Tanzania has passed two laws, which protect the rights of women. One is the *Sexual Offences Special Provisions Act of 1998*, the other is a set of laws known as the *Land Law Act and the Village Land Act of 1999.*

Methodologies for the economic empowerment of women and poverty eradication include:

- The promotion of the establishment of women's groups as a way of making credit facilities available.
- Training women in entrepreneurial skills, management capabilities, and marketing skills.
- Improving women's access to technology and social services.
- Assisting women in setting up savings and credit societies.
- Establishment of the *"Women's Development Fund (WDF)"* for giving loan support to income-generating projects.
- Establishment of the *"Credit for Rural Enterprises for Women (CREW) (T)".*
- Numerous other credit facilities are operated by CBOs and local and international NGOs.

Methodologies for women's political empowerment and decision making

(i) Increasing the number of women in parliament and local councils

Women have been mobilized to contest for various seats

i. Encouraging women to be involved in elections, both as voters and candidates, through media campaigns, public meetings, workshops and seminars.
ii. The government plans to ensure that at least 30% of those appointed in political and public services are women. Gender focal points were set up in all ministries and regional structures.

Methodologies for improving women's access to education, training and employment

- Steps to increasing the enrolment of girls in schools by making the school environment more attractive to female students by, for example, increasing the number of female teachers, providing financial support to girls, improving reproductive health education in schools, providing more boarding facilities, and making curricula and textbooks more gender sensitive.
- Establishment of girls' vocational training centers and technical secondary schools.
- Sensitization of parents so that they encourage girls to further their education.
- Launching of short courses relevant to women's needs.

3.1.5 Current Status of Implementation of the Strategy

Generally, the achievements have been short of the goals set. Major constraints have been financial limitations on the part of the government and non-fulfilment of the international obligations (according to the Beijing Platform for Action), including the debt burden.

[…]

4. STRATEGIES WHICH EMPHASIZE ENVIRONMENTAL ISSUES

4.3 The National Energy Policy (2000)

4.3.1 The Origin of the Idea

The first National Energy Policy of Tanzania was put in place in April 1992. Since then, the energy sector, as well as the overall economy, has gone through profound changes. In line with the recommendations in the National Energy Policy of 1992, the policy has been revised taking into account structural changes in the national economic and global political transformations, which together have led to the restructuring and liberalization of all sectors of the economy. Following these changes, the Government of Tanzania felt it was important

for each sector to have or revise policies and strategies so that they suit the new macroeconomic environment.

4.3.2 Major Policy Objectives of the Strategy

Overall Objective

The National Energy Policy overall objective is to ensure availability of reliable and affordable energy supplies and their use in a rational and sustainable manner in order to support national development goals.

Specific Objectives

The specific objectives of the policy include:-

i. To establish an efficient energy production, procurement, distribution and end-use system in an environmentally sound manner with due regard to international energy cooperation and gender issues.
ii. To enhance the harnessing of indigenous energy resources in order to diversify energy services and reduce the dependence on imported petroleum based products.

4.3.3 Key Stakeholders involved in the Strategy

A list of stakeholders (institutions) who participated in one way or another during formulation stage include the Ministry of Finance, Planning Commission, the Ministry of Natural Resources and Tourism and Ministry of Water. Other institutions were the Ministry of Lands and Human Settlements Development, Ministry of Transport and Communication, Ministry of Trade and Commerce and the Swedish International Development Cooperation Agency (SIDA).

4.3.4 Methodology /Process used to Formulate the Policy

During the process of revising the energy policy an interactive and participatory process between the government, stakeholders and relevant groups was an important part of the process in order to incorporate views of market actors and energy consumers to address the complex nature of the sector.

The exercise involved a consultant AF International who also involved the local stakeholders to form a task force. The task force came up with a draft Energy Policy. Among the local

consultants and NGOs who were involved in the process are Kipondya & Company (a local consulting firm) and CEEST (a local NGO).

Also important to mention is the fact that AF International was working very closely with the ministry's experts. The task force organised three stakeholders' workshops where the draft policy was discussed and improved accordingly. One workshop was organized for parliamentarians. In addition, a study visit was carried out to South Africa, Uganda and Sweden.

4.3.5 Current Status of Implementation of the Policy

Regarding the extent of implementation and achievement of the objectives of the strategy, some progress has been made. More energy comes from local sources today than it used to be before the revision of the policy. Approximately 80% of the domestic energy consumption comes from indigenous sources, as exploration works for e.g. fuel have to a certain extent been accomplished. There is coal production at Kiwira where the plan is to expand production from 6 to 30 megawatts. A new hydropower station has just been officially opened at Kihansi in Morogoro region.

4.3.6 Major Problems during Policy Formulation

The major problems which were pointed out by stakeholders as drawback implementing the policy included the following:-

i. dependency on foreign assistance;
ii. inadequate commitment of the key stakeholders;
iii. financial constraint;
iv. poor expertise and technological capacity.

What is more problematic is, that the solutions to the problems depend on foreign assistance, and there is no clear indication in the document of some kind of political commitment. Nevertheless, stakeholders made the following observations in respect of political commitment: many key stakeholders were involved during the formulation stage. They included members of parliament (MPs) and the ministers through the Inter-Ministerial Technical Committee and the Cabinet. Further, MPs were involved during the stakeholders' workshops, and for the minister's during the approval of the policy.

PART 2

KENYAN GOVERNMENT GUIDELINES ON THE CDM

In order to ensure that CDM projects are environmentally effective and lead to sustainable development as well, they must be based on principles of equitable allocations and be directed to projects focused on non-greenhouse gas emitting technologies, especially renewable energy technologies. Consequently, for developing countries like Kenya to derive maximum benefits from CDM projects, a number of issues must be taken into account, including, but not limited to, the following:

Project Criteria

All CDM projects must satisfy the following requirements:

- demonstrate a firm and tangible contribution to sustainable development;
- be supportive of and consistent with national development priorities and be linked to poverty reduction;
- implement technologies that are locally appropriate, environmentally friendly, and energy efficient; have necessary precautions in place to avoid dumping of substandard technologies;
- contribute to the enhancement of national institutional and human capacity building;
- accord highest priority to activities that generate maximum economic, social, and environmental benefits;
- address community needs and priorities through effective public participation in project design, planning, and implementation to ensure equitable distribution of sustainable development benefits;
- contribute to global efforts to achieve stabilisation of greenhouse gas concentrations in the atmosphere in accordance with Article 2 of the Convention;
- ensure that CDM financial inflows are over and above the existing Official Development Assistance (ODA); and
- be consistent with the objectives of Agenda 21 and relevant environmental conventions, such as the Convention on Biological Diversity, the Ramsar Convention on Wetlands, and the Convention to Combat Desertification, as well as with local and national environmental management laws.

Share of Proceeds

The sharing of proceeds from CDM activities is a crucial issue of interest to Kenya, like any other Party to the UNFCCC. However, the share of proceeds shall be based on a formula to be agreed on by the international community under the auspices of the Conference of the

Parties/Meeting of the Parties (COP/MOP). The proceeds to be shared will include the emissions reduction or offset credits. CDM projects must include a nominal levy (adaptation levy) of the savings accruing to the investing country Party, the percentage of which will be determined by COP/MOP. Kenya will support such an agreement on the share of proceeds provided that a significant portion of the shares remain behind.

Methodological Issues

The methodological issues that deal with operation of CDM projects at the national level should take the following into consideration:

Baselines

Baselines need to be developed on a project-by-project basis during the initial phases of CDM. Sectoral baseline arrangements should be avoided as they could result in "free-riding" projects that claim emissions reductions that either would have happened anyway or that in reality do not accrue. Moreover, any project proposed under CDM must result in lower emissions than the current business-as-usual scenario. The prevailing business-as-usual scenario will serve as the basis for determining the level of CERs accruing from project implementation.

Project Validation

Every CDM project must be thoroughly assessed to determine whether the proposed action conforms to the criteria identified above before it is validated by the CDM National Clearing House (NCH).

Verification and Certification

Verification and certification will take place at two levels. At the national level, the National Climate Change Focal Point (NCCFP) will appoint a panel of local experts to verify the CERs accruing from all CDM projects while, at the international level, a body designated by the COP/MOP will perform certification and verification of all CDM projects.

Project Monitoring and Evaluation (M&E)

Once a CDM project implementation gets underway, a mechanism for regular M&E will be developed. The purpose of M&E is to ensure that the project implementation conforms to the set criteria throughout the project lifecycle.

Project Financing

The financing arrangement will be agreed upon by a host entity and the Annex I Party investor. Once an agreement has been reached, the project proposal will be submitted to the respective governments for approval and any other necessary action.

Land Use, Land Use Change, and Forestry (LULUCF)

There are still far too many scientific uncertainties associated with carbon sequestration by forests and land use changes. These uncertainties are compounded by the lack of capacity to quantify these changes in Kenya. CDM forestry projects are long term by nature and it would be difficult to deny Kenyans the use of forest products and services reserved for CDM when the Kenyans need them. Moreover, there is minimal or no technology transfer in the afforestation programs as stated in the CDM.

While the demand for forestry products is growing nationally and internationally against the background of a dwindling forestry resource base, there is no doubt about the need for forestry projects in Kenya. Forestry projects should continue within other frameworks, such as the UN Convention on Biodiversity and the UN Convention to Combat Desertification, as well as through other bilateral or multilateral arrangements. Decisions on LULUCF projects under CDM should be suspended until scientific uncertainties and other outstanding issues are resolved at the COP/MOP level.

APPENDIX 10

Baseline emissions calculations for power grids and net emissions reductions calculations

BASELINE EMISSIONS CALCULATIONS FOR POWER GRIDS AND NET EMISSIONS REDUCTIONS CALCULATIONS

Greenhouses gazes and their properties

Greenhouse gases (GHGs) in the atmosphere create a "greenhouse effect" that keeps the Earth's surface much warmer than it would otherwise be by trapping outgoing infrared radiation. The six primary GHGs of concern are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6).

The greenhouse effect is predicted to instigate a rise in average global temperatures of 1.4℃ to 5.8℃ over this century — hence the term "global warming." However, this temperature rise will be accompanied by weather extremes, which is why this phenomenon is more accurately described as climate change.

High levels of emissions from human activities have caused concentrations of GHGs in the atmosphere to increase markedly since the beginning of the industrial era, adding an extra "human-induced greenhouse effect." Since 1750, atmospheric concentrations of carbon dioxide have increased by 31%, methane by 151%, and nitrous oxide by 17%.

Measures that can be taken to reduce GHG emissions include improving energy efficiency, switching to less carbon-intensive fuels, increasing the use of renewable energy, and adopting cogeneration technologies. Some sectors also have cost-effective opportunities to reduce fugitive and industrial process emissions.

Table A provides an overview of the various GHGs and their properties. The standard for reporting GHG emissions is in carbon dioxide equivalent (CO_2e). To obtain this, each GHG must be multiplied by its Global Warming Potential (GWP). For example, if a landfill releases 10 Mt of methane a year, the CO_2 equivalent is 10 Mt x 21 (GWP) = 210 Mt. Therefore, the landfill releases 210 Mt CO_2e/year.

Table A: Properties of Greenhouse Gases

Greenhouse Gas	Chemical Symbol	Global Warming Potential (GWP)
Carbon dioxide	CO_2	1
Methane	CH_4	21
Nitrous oxide	N_2O	310
Hydrofluorocarbons	HFC-23	11,700
	HFC-125	2,800
	HFC-134a	1,300
	HFC-152a	140
Perfluorocarbons	CF_4 (Tetrafluromethane)	6,500
	C_2F_6 (Hexafluroethane)	9,200
Sulphur hexafluoride	SF_6	23,900

Emissions Coefficients for Electric Power Grids

Weighted Average Grid Emissions Coefficients

In a CDM project that displaces grid electricity through electricity efficiency or fuel substitution, the project baseline emissions are those from the generation of electricity in the national grid for each year of the CDM crediting period (7 or 10 years).

To estimate these baseline emissions, two things are required:

1. the **typical daily load curve**; and
2. the **power plants dispatched** to satisfy that typical load curve each hour of the day.

The baseline is, therefore, the **weighted average CO_2 emission per unit of electricity** (kWh) produced by the grid for the different years of the crediting period.

This can be computed using **a simple dispatch rule** from the following information:

- the daily load curve;
- the type of power plant, i.e., baseload or peaking;
- the efficiencies of the different power plants;
- the fuel used in each power plant;
- planned capacity expansion; and
- assumed marginal power plants beyond the utility plan period.

This approach must be used when the electricity displaced is from any grid that does not use a single power source (e.g., a diesel mini-grid). It allows the use of published or commonly used standard emissions coefficients for the local or regional power grid based on current common characteristics of the grid. These include annual power production and efficiencies for each power plant (hydro, coal, natural gas) in each year that CERs will be claimed. These coefficients will be the same for all CDM projects operating in the region, unless the project specifically addresses one aspect of the load curve — e.g., reducing peak demand.

Weighted average emissions coefficient (kg/kWh) =

$$\frac{\text{Sum product [electricity produced by each plant (kWh/yr) * emissions coefficient for that plant (kg/kWh)]}}{\text{Total electricity generated}}$$

In areas where there is a rapid increase in the demand for electricity, emissions coefficients for the so-called "built marginal" plants may be used. This is the weighted average of the five most recently built power plants or the plants that meet the most recent 20% of demand.

Weighted average emissions coefficient for built marginal (kg/kWh) =

$$\frac{\text{Sum product [electricity produced by each plant (kWh/yr) * emissions coefficient for that plant (kg/kWh)]}}{\text{Electricity generated by the five most recent plants or 20\% of current demand}}$$

If the project addresses peak demand, then emissions coefficients for the plants that are used to meet peak demand (e.g., gas turbine generators) may be used.

How to Allow for Transmission and Distribution (T&D) Losses

Transmission losses occur in the high voltage network that delivers power to local substations. These losses are relative low and usually are less than 5%.

Distribution losses occur in the medium and low voltage feeders that supply individual customers. These losses depend on the length and loading of the feeders, and the voltage in these feeders. However in the case of low voltage rural feeders, very long, and chronically overloaded, the voltage drops of 40% can occur by the end of the feeder and losses up to 20% or more are common.

These T&D losses are called “technical losses,” Many States, however, include “non-technical losses,” such as theft or other unmetered/uncollected uses, in T&D losses. The usual practice is also to load all losses for all sectors into the catch-all of “agriculture.” This means the total “losses” can be 35% or even higher.

T&D losses only need to be taken into account in end-use demand side electricity efficiency CDM projects. A power generation project, such as wind or micro-hydro, will still be subject to the same losses, whereas an efficiency project will displace both generation and technical losses (not theft, etc.).

In an efficiency project, care must be taken to use T&D losses that are appropriate to the end use. A rural efficiency project should use typical or published technical losses for rural feeders. An urban efficiency project should use lower losses.

Baseline electricity usage = electricity consumption by baseline technology / (1 – T&D losses)

Annual electricity savings = end-use savings in electricity / (1 – T&D losses)

A Case Study – Bangladesh

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The average daily load curve for Bangladesh shows that approximately 85% of the energy dispatched is baseload, even though the peak power requirement is nearly 50% of the baseload requirement. This implies that the intermediate and peaking plants will have an average annual load factor (ALF) below 30%, and indeed some will have an ALF of 20% or less. Table 1 presents data related to the gas-based power plants that can only be used as base load.

Table 1: Baseload Natural Gas Power Plants and Their Base Year (2001) Generation

No.	Name	Type (fuel)	Generation Capacity (MW)	Base Year Net Generation (GWh)	Heat Rate	Retirement Year
1	Ashuganj 1-2	ST (gas)	100	670	15,034	2006
2	Ghorasal 1-2	ST (gas)	80	415	16,022	2006
3	Siddhirganj	ST (gas)	50	293	13,812	2006
5	Ashuganj	CC (gas)	74	173	15,873	2010
7	Chittagong	ST (gas)	55	328	15,350	2014
8	Ashuganj 3-5	ST (gas)	450	2,730	11,724	2015
9	Fenchuganj	CC (gas)	90	273	13,110	2015
10	Ghorasal 3-6	ST (gas)	840	4,077	12,141	2017
11	Rauzan	ST (gas)	420	1,583	11,981	2017
Total			**2,159**	**10,542**		

From the existing power plants, nearly 1,500 MW will remain operational up to and beyond 2014. The box below shows the gas turbines and oil-fired power plants of the national grid, along with their base year generation.

Gas turbine	763 MW	3,621 GWh
Oil-fired power plants	436 MW	1,123 GWh
(i) Steam turbine (FO)	262 MW	905 GWh
(ii) Diesel	132 MW	191 GWh
(iii) LDO/SKO	49 MW	27 GWh

As can be seen, 262 MW of the oil-fired capacity is baseload, while the remaining 181 MW is peaking capacity. The oil-fired power plants are all expected to be phased out and the predominant peaking plant will be a gas-fired combustion turbine power plant. In the base year (FY01), the gas turbines and peaking oil-fired power plants produced a total of 3,839 GWh of electricity, which is 24% of the total 16,254 GWh produced.

To estimate future emission coefficient, the marginal power plants need to be identified. It is obvious that the starting point for this is the government/utility plan. The national utility's capacity expansion plan up to 2008 is shown in summarized form in Table 2.

Table 2: Utility Capacity Expansion Plan

	FY02	FY03	FY04	FY05	FY06	FY07	FY08
New CC	360	810	980	1,380	2,280	2,370	2,820
New coal					250	250	250
New ST	210	210			270	690	690
New hydro							100
ST addition to simple cycle	40	149			149	149	149

NOTE: CC = Combined Cycle; ST = Steam Thermal; FY = Financial Year.

The most noteworthy aspect of the proposed expansion program is the nearly 3,000 MW combined cycle power plants. With increasing demand for electricity, more and more new baseload plants will be added. It is now almost a certainty that most new baseload power plants will be gas-fired combined cycle ones, with a heat rate of 7,200 kJ/kWh or better. This implies that emissions from the national grid baseload power generation will keep on decreasing.

A very simplified dispatch rule, as detailed below, was used to estimate the year-wise weighted average CO_2/kWh for the national grid for the crediting period from 2005 to 2014.

(i) In the financial year 2001 (FY2000–01), the central load dispatch centre dispatched 16,254 GWh of electricity. The power plants used for this purpose, along with their base year data, are shown in Appendix A. The base year production has been used to determine the annual load factor (ALF) for the existing plants in the national grid.

(ii) The available capacity during the crediting period has been worked out based on the information provided in Table 1 about the existing gas-fired baseload plants.

(iii) The general shape of the load curve is assumed to remain the same over the 10-year crediting period. In particular, it is assumed that the intermediate and peak electricity will be a fixed proportion of the total electricity requirement.

(iv) From an analysis of the energy curve of August 20, 2002, the intermediate and peak electricity consumed is estimated to be 15% of the total electricity consumed. Since it has been assumed that this ratio will remain fixed for every day of the crediting period, the annual energy electricity requirement can be multiplied by 0.15 to determine the intermediate and peak electricity requirement for any given year.

(v) During the crediting period, the intermediate and peak MWh requirement, above that which can be supplied by the existing plants and those planned up to 2008, has been assumed to be entirely supplied by gas turbine power plants with an efficiency of 27.5% (heat rate of 13,091 kJ/kWh).

(vi) The electricity requirement up to 2008 is met by the existing plants minus the retired ones plus the planned power plants shown in Table 1.

(vii) Beyond 2008, the baseload is supplied predominantly by combined cycle gas-fired power plants with a thermal efficiency of 50% (heat rate of 7,200 kJ/kWh). A small amount of supply is projected to be available from a 250 MW addition to the coal-fired power plant expected to go into operation in 2006. Additionally, 1,000 MW of steam thermal power plants, which might be built as extensions to the existing and planned steam thermal plants, and for which finance may be made available through mechanisms like supplier's credit, have been assumed.

The Bangladesh Power Development Board's Power Sector Master Plan has estimated that the electricity demand growth would be approximately 8% up to 2015. There is already evidence that such a high growth rate will probably not be realized. There are clear indications that the economy will not perform as projected and that the ambitious capacity expansion plans will not materialize. Thus, for this project, a 7% demand growth has been used. Assuming a demand growth of 7%, the electricity requirement between 2005 and 2014 has been calculated starting with a base year (FY01) net generation of 16,254 GWh, and is presented in the second column of Table 3. These data have been used along with the dispatch rule discussed above to arrive at the weighted average CO_2 emission of the grid. The full details of the calculations appear in Annex A. Table 3 presents a summary of the final results of those calculations. Column 3 presents the power requirement in MW to meet the projected demand. The weighted average CO_2 emission for the grid is presented in column 5, while column 4 presents the hypothetical equivalent based on entirely natural gas generation.

Table 3: Weighted Average CO2 Emissions During the Crediting Period (2005 to 2014)

Year	GWh	MW	Average Heat Rate Based on Natural Gas Generation (kJ/kWh)	Weighted Average CO_2 Emissions (kg/kWh)
2001	16,254	3,588	12,993	0.7289
2005	21,306	4,242	11,168	0.6159
2006	22,797	4,465	11,587	0.6421
2007	24,393	4,803	11,614	0.6455
2008	26,100	5,068	11,375	0.6329
2009	27,927	5,343	11,137	0.6202
2010	29,882	5,590	11,293	0.6313
2011	31,974	5,922	11,055	0.6183
2012	34,212	6,270	10,856	0.6075
2013	36,607	6,643	10,673	0.5974
2014	39,170	6,946	10,358	0.5788
Mean (2005 to 2014) weighted average CO_2 emissions = 0.6190 kg/kWh				

Annex A

Calculation of Weighted Average Grid Emissions Coefficient for Bangladesh

GAS TURBINES

	MW	Heat Rate	MW-%	HR-Weight
Ashuganj	50	23569	0.0655	1544
Shah 1	70	19818	0.0917	1818
Shah 2	70	15561	0.0917	1428
Shylet	20	15899	0.0262	417
Haripur	90	11266	0.1180	1329
Chattagong	52	13110	0.0682	893
Baghabari	71	13753	0.0931	1280
Westmont	90	16275	0.1180	1920
NEPC	110	16275	0.1442	2346
RPCL	140	13110	0.1835	2406
	763			15381

23.4% → Weighted Average Efficiency

GAS STEAM TURBINES and COMBINED CYCLE

	MW	GWh	Heat Rate	MW-%	HR-Weight
Ashuganj 1-2	100	670	15034	0.0463	696
Ghorasal 1-2	80	415	16022	0.0371	594
Siddhirganj	50	293	13812	0.0232	320
Ashuganj CC	74	173	15873	0.0343	544
Chittagong	55	328	15350	0.0255	391
Ashuganj 3-5	450	2730	11724	0.2084	2444
Fenchuganj	90	273	13110	0.0417	547
Ghorasal 3-6	840	4077	12141	0.3891	4724
Rauzan	420	1583	11981	0.1945	2331
	2159	**10542**			**12590**

28.6% Weighted Average Efficiency

OIL-FIRED – STEAM TURBINES, CT and DIESEL ENGINES

	MW	Heat Rate	MW-%	HR-Weight
Khulna 1	95	14982	0.2179	3264
Khulna 2	55	15000	0.1261	1892
Khulna 3	46	13110	0.1055	1383
Bheramara	54	16444	0.1239	2037
Saidpur	18	16108	0.0413	665
Barisal	40	16108	0.0917	1478
Rangpur	18	16108	0.0413	665
KPCL	110	16275	0.2523	4106
	436	**124135**		**15490**

23.2% → Weighted Average Efficiency

WEIGHTED AVERAGE GRID EMISSION FOR 2005

	Electricity		Power		Efficiency		CO_2	
	GWh	(%)	MW	ALF	HR	(%)	kg/kWh	Weight
New CC	3638	16.5%	519	0.8	7200	50.0%	0.4039	0.0665
New Coal	0	0.0%	0	0.7	11077	32.5%	1.0479	0.0000
New ST	1288	5.8%	210	0.7	11077	32.5%	0.6214	0.0362
New GT	1567	7.1%	358	0.5	13091	27.5%	0.7344	0.0521
ST addition	914	4.1%	149	0.7	0	100.0%	0.0000	0.0000
Hydro (old+new)	1007	4.6%	230	0.5	0	100.0%	0.0000	0.0000
Old ST+CC (gas)	10402	47.0%	2159	0.55	12587	28.6%	0.7062	0.3322
Old Oil (all)	883	4.0%	336	0.3	15517	23.2%	1.1379	0.0454
Old GT	2414	10.9%	501	0.55	15385	23.4%	0.8631	0.0942
TOTAL	22113	100.0%	**4462**					**0.6265**

CC - Combined Cycle, ST - Steam Turbine, GT - Gas Turbine
ST Addition - Adding steam turbine to existing gas turbine
ALF - Annual Load Factor Gas Generation HR - Heat Rate (kJ/kWh)

Average Heat Based on Natural Gas Generation → 11168

WEIGHTED AVERAGE GRID EMISSION FOR 2014

	Electricity		Power		Efficiency		CO_2	
	GWh	(%)	MW	ALF	HR	(%)	kg/kWh	Weight
New CC	17132	38.8%	2445	0.8	7200	50.0%	0.4039	0.1565
New Coal	3066	6.9%	500	0.7	11077	32.5%	1.0479	0.0727
New ST	4231	9.6%	690	0.7	11077	32.5%	0.6214	0.0595
New GT	6721	15.2%	1534	0.5	13091	27.5%	0.7344	0.1117
ST addition	914	2.1%	149	0.7	0	100.0%	0.0000	0.0000
Hydro (old+new)	1445	3.3%	330	0.5	0	100.0%	0.0000	0.0000
Old ST+CC (gas)	8432	19.1%	1750	0.55	12587	28.6%	0.7062	0.1347
Old Oil (all)	289	0.7%	110	0.3	15517	23.2%	1.1379	0.0074
Old GT	1975	4.5%	410	0.55	15385	23.4%	0.8631	0.0386
TOTAL	44205	100.0%	**7918**					**0.5811**

CC - Combined Cycle, ST - Steam Turbine, GT - Gas Turbine
ST Addition - Adding steam turbine to existing gas turbine
ALF - Annual Load Factor HR - Heat Rate (kJ/kWh)

Average Heat Based on Natural Gas Generation → 10358

Net Emissions Reductions Calculation

Determination of the net emissions reduction will facilitate the financial analysis since the international carbon market will be based on $ per tonne of CO_2equivalents (CO_2e) or C. The conversion of CO_2e to C is easily accomplished by multiplying the tonnes of CO_2e by 0.273.

The units of each gas must be specified individually. Not all greenhouse gases (GHGs) are easily measured in tonnes or megatonnes (the conventions for emissions reporting) since they are present in much smaller quantities. However, the final calculation should report all GHG emissions in tonnes (t) of carbon dioxide equivalent (CO_2e).

Note also that there are several types of HFCs and CFCs, as identified in Step 4 below; each, if applicable, should be included in Steps 1 to 3.

1. Determine Total Baseline Emissions

		CO_2	CH_4	N_2O	HFC	CFC	SF_6
A	**On-site emissions**						
B	**Off-site emissions**						
C	**Total Baseline Emissions (A+B)**						

2. Determine Total Project Emissions

		CO_2	CH_4	N_2O	HFC	CFC	SF_6
D	**On-site emissions**						
E	**Off-site emissions**						
F	**Total CDM Project Emissions (D+E)**						

3. Determine Net Emissions Reduction

		CO_2	CH_4	N_2O	HFC	CFC	SF_6
C	**On-site emissions**						
F	**Off-site emissions**						
G	**Net Emissions Reductions (C-F)**						

4. Convert Net Reductions into CO_2e using the Global Warming Potential (GWP) of Each GHG

	Net GHG Reduction (From G above, in tonnes)	**GWP**	**CO_2e (tonnes)**
CO_2		1	
CH_4		21	
N_2O		310	
HFC-23		11,700	
HFC-125		2,800	
HFC-134a		1,300	
HFC-152a		140	
CF_4		6,500	
C_2F_6		9,200	
SF_6		23,900	
Total Emissions Reductions			