



# Nile Basin Initiative

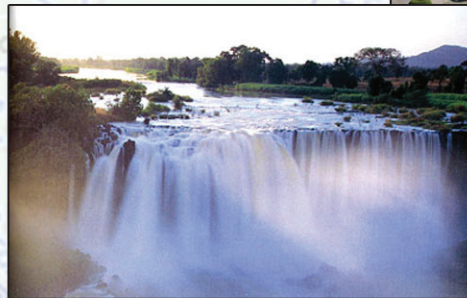
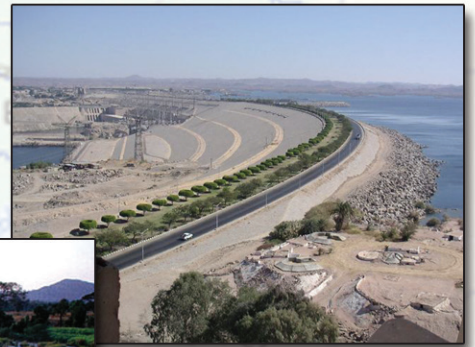


## REGIONAL POWER TRADE PROJECT

### Environmental Assessment Framework for Regional Power Projects in Nile Basin Countries

*Final Report*

*February 2008*



**Tecsum International Limited**

consultants

85 Sainte-Catherine Street West, Montréal, Québec, Canada





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05-16005

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**MODULE 1**

Executive Summary ..... 1

Résumé.....17

**MODULE 2**

1 INTRODUCTION ..... 1-1

1.1 Background ..... 1-1

1.2 Objective, purpose and scope of the EA framework for regional power projects ..... 1-2

1.3 Contents of the EA framework ..... 1-3

2 NILE RIVER BASIN AND NILE BASIN INIATIVE..... 2-1

2.1 General description of the Nile basin ..... 2-1

2.2 NBI countries ..... 2-5

2.2.1 Eastern Nile countries ..... 2-6

2.2.2 Nile Equatorial Lakes countries ..... 2-7

2.3 NBI strategic action program..... 2-9

3 POWER SECTOR IN THE NBI COUNTRIES ..... 3-1

3.1 Eastern Nile ..... 3-1

3.1.1 Egypt..... 3-1

3.1.2 Sudan..... 3-3

3.1.3 Ethiopia ..... 3-5

3.1.4 Ethiopia-Sudan Transmission Interconnection Project..... 3-6

3.2 Nile Equatorial Lakes ..... 3-8

3.2.1 Current Situation of the Power Sector ..... 3-8

3.2.2 NELSAP Power Development Strategy ..... 3-10

4 ENVIRONMENTAL AND SOCIAL FRAMEWORK AND PROCEDURES IN THE NILE BASIN COUNTRIES ..... 4-1

4.1 Environmental policy..... 4-2

4.2 EIA procedures and regulations ..... 4-3

4.3 Water resources management policy ..... 4-7

4.4 Climate change policies ..... 4-9

4.5 Forest conservation / Biodiversity ..... 4-10

4.6 International environmental treaties and conventions..... 4-11

4.7 Land issues and resettlement policy ..... 4-11

4.8 Poverty reduction and socio-economic development ..... 4-13

4.9 Public health policy ..... 4-14

4.10 Vulnerable groups including women policy ..... 4-15

4.11 Historical and cultural sites policy and regulation ..... 4-17

4.12 Indigenou community policy ..... 4-18

	page
4.13 Institutional framework in the NBI countries .....	4-20
<b>5 ISSUES RELATED TO ENVIRONMENTAL ASSESSMENT CONSIDERED BY FUNDING AGENCIES.....</b>	<b>5-1</b>
5.1 Environmental policies .....	5-1
5.2 Environmental and social assessments procedures .....	5-3
5.3 Natural resources management policy .....	5-6
5.4 Resettlement policy .....	5-7
5.5 Poverty reduction .....	5-9
5.6 Public health .....	5-10
5.7 Vulnerable groups including women.....	5-11
5.8 Historical and cultural sites policy.....	5-12
5.9 Indigenous communities policy.....	5-12
5.10 Participation / Consultation.....	5-13
5.11 Dams Policy .....	5-14
5.12 International Waterways Policy .....	5-14

### MODULE 3

<b>6 SUSTAINABILITY IN REGIONAL POWER PROJECTS .....</b>	<b>6-1</b>
6.1 Millennium Development Goals.....	6-1
6.2 Ecological aspects of power projects sustainability .....	6-3
6.3 Social aspects of power projects sustainability .....	6-6
6.3.1 Changes to the use of natural resources in the project area .....	6-7
6.3.2 Involuntary resettlement .....	6-9
6.3.3 Indigenous communities .....	6-12
6.3.4 Gender issues .....	6-13
6.3.5 Public health issues.....	6-16
6.3.6 Physical cultural resources .....	6-18
6.3.7 Participation and consultation of the stakeholders .....	6-19
6.4 Economic aspects of power projects sustainability .....	6-22
6.5 Positive impacts of regional power projects on local communities.....	6-25
<b>7 ENVIRONMENTAL ASSESSMENT PROCESS FOR REGIONAL POWER PROJECTS.....</b>	<b>7-1</b>
7.1 Justification of the EA framework for regional power projects.....	7-1
7.2 Environmental assessment principles .....	7-3
7.3 General EA process for regional power projects .....	7-8
7.4 Project identification .....	7-13
7.4.1 Pre-screening (Step 1).....	7-13
7.4.1.1 Preparation of the Project Notice.....	7-13
7.4.1.2 Analysis of the Project Notice.....	7-14
7.4.2 Screening (Step 2).....	7-15
7.4.3 Environmental screening administrative procedure.....	7-20
7.5 Project preparation.....	7-21
7.5.1 Scoping (Step 3).....	7-22
7.5.1.1 Environmental scoping main activities and administrative procedure.....	7-22
7.5.1.2 Special social issues to consider at the scoping step .....	7-24

	page
7.5.2	Impact Assessment (Step 4) ..... 7-26
7.5.2.1	EA Instruments ..... 7-26
7.5.2.2	Environmental Assessment Administrative Procedure ..... 7-30
7.6	Project appraisal and approval..... 7-30
7.6.1	Review of the studies (Step 5)..... 7-30
7.6.1.1	Internal review ..... 7-33
7.6.1.2	External review (Disclosure of the studies and public consultation) ..... 7-33
7.6.1.3	Completion of the studies..... 7-34
7.6.2	Decision-making (Step 6) ..... 7-34
7.6.3	Review and Decision-making Administrative Procedure ..... 7-35
7.7	Project Implementation and Supervision ..... 7-37
7.7.1	ESMP implementation (Step 7) ..... 7-37
7.7.2	Administrative procedures for the ESMP implementation ..... 7-39
7.8	Project Post-Evaluation..... 7-40
7.8.1	Auditing (Step 8) ..... 7-40
7.8.2	Administrative procedures for the audit ..... 7-41
7.9	Institutional Responsibilities in the EA Process Implementation..... 7-42
8	ISSUES TO CONSIDER IN THE PREPARATION OF EIA FOR REGIONAL POWER PROJECTS ..... 8-1
8.1	Construction of power facilities ..... 8-1
8.2	Hydropower projects..... 8-7
8.2.1	General characteristics of hydropower projects ..... 8-7
8.2.2	Environmental issues related to hydropower projects..... 8-9
8.2.3	Social issues related to hydropower projects..... 8-10
8.2.4	Potential impacts of hydropower projects and mitigation measures..... 8-12
8.3	Thermal power projects ..... 8-17
8.3.1	General characteristics of thermal power projects ..... 8-17
8.3.2	Environmental issues related to thermal power projects ..... 8-17
8.3.3	Social issues related to thermal power projects..... 8-18
8.3.4	Impacts of thermal power projects and mitigation measures ..... 8-19
8.4	Geothermal power projects ..... 8-23
8.4.1	General characteristics of geothermal power projects ..... 8-23
8.4.2	Environmental issues related to geothermal power projects ..... 8-24
8.4.3	Social issues related to geothermal power projects ..... 8-24
8.4.4	Potential impacts of geothermal power projects and mitigation measures ..... 8-25
8.5	Power transmission lines ..... 8-28
8.5.1	General characteristics of power transmission lines ..... 8-28
8.5.2	Environmental issues related to power transmission lines ..... 8-29
8.5.3	Social issues related to power transmission lines..... 8-29
8.5.4	Impacts of power transmission lines and mitigation measures ..... 8-31
9	LIFE CYCLE AND SYSTEMS APPROACH IN THE EIA FRAMEWORK..... 9-1
9.1	Life cycle assessment in EA ..... 9-1
9.2	Definition of life cycle assessment ..... 9-2
9.3	Life cycle assessment international standards ..... 9-4
9.4	Life cycle assessment in the EA process for regional power projects in the NBI countries ..... 9-5
9.5	Guidelines for conducting a life cycle assessment ..... 9-7

	page
9.5.1	Goal and scope of the project..... 9-7
9.5.2	Inventory analysis (extraction and emission) ..... 9-10
9.5.2.1	Guidelines specific to hydropower projects ..... 9-13
9.5.2.2	Guidelines specific to geothermal power plants..... 9-14
9.5.2.3	Guidelines specific to thermal power plants..... 9-15
9.5.2.4	Guidelines specific to transmission lines ..... 9-16
9.5.3	Impact assessment requirements ..... 9-17
9.5.4	Impact assessment interpretation ..... 9-20
10	ACCESS TO THE CLEAN DEVELOPMENT MECHANISM FUND ..... 10-1
10.1	Overview of the Clean Development Mechanism ..... 10-1
10.1.1	Origins of the Clean Development Mechanism ..... 10-1
10.1.1.1	Climate Change Convention ..... 10-1
10.1.1.2	Kyoto Protocol..... 10-2
10.1.1.3	Convention of Parties 7 (COP-7) in Marrakech ..... 10-2
10.1.2	International Standards on GHG..... 10-3
10.1.3	Advantages for the host country ..... 10-4
10.2	Requirements and issues related to CDM projects..... 10-5
10.2.1	Basic CDM Project Requirements ..... 10-5
10.2.2	Project Participants..... 10-6
10.2.3	Eligibility to participate in the CDM ..... 10-7
10.2.4	CDM Project Costs ..... 10-7
10.2.4.1	Project Costs..... 10-7
10.2.4.2	Transaction Costs ..... 10-7
10.2.4.3	Small-scale projects ..... 10-8
10.2.5	Financing Options in a CDM Project..... 10-9
10.2.5.1	Full or Partial Equity ..... 10-9
10.2.5.2	Financial Contribution ..... 10-10
10.2.5.3	Loan..... 10-11
10.2.5.4	CER Purchase Agreement ..... 10-11
10.2.6	Risk, Ownership, and Legal Aspects ..... 10-12
10.3	Establishing a National Authority ..... 10-13
10.3.1	Definition ..... 10-13
10.3.2	DNA functions ..... 10-13
10.3.2.1	The Regulatory Function ..... 10-14
10.3.2.2	The Promotional Function ..... 10-18
10.3.3	Initial assessment..... 10-19
10.3.4	Sustainable Development Criteria ..... 10-22
10.3.5	Steps in Creating a DNA..... 10-24
10.3.6	Tasks assigned to the DNA ..... 10-26
10.4	Frameworks and directives for developing and implementing a CDM for power project ..... 10-27
10.4.1	Integration of CDM in the EA Process for Regional Power Projects..... 10-27
10.4.2	General CDM Process for power projects..... 10-29
10.4.3	Step 1: Project screening..... 10-30
10.4.4	Step 2: Project Development ..... 10-31
10.4.4.1	Choose Project Boundary ..... 10-31
10.4.4.2	Select project baseline ..... 10-32
10.4.4.3	Set crediting period ..... 10-34
10.4.4.4	Calculate Emission reductions ..... 10-35
10.4.4.5	Develop Emissions Monitoring and Verification Protocol ..... 10-36
10.4.4.6	Prepare Investment Plan and Undertake Financial Analysis .... 10-37



---

	page
10.4.4.7 Prepare Draft Project Design Document (PDD) .....	10-38
10.4.5 Step 3: National Approval.....	10-40
10.4.5.1 Undertake Environmental Impact Assessment.....	10-40
10.4.5.2 Obtain Stakeholders' Comments.....	10-41
10.4.5.3 Obtain Host Country Approvals.....	10-41
10.4.5.4 Case of multilateral projects.....	10-41
10.4.6 Step 4: Validation and Registration .....	10-42
10.4.7 Step 5: Implementation and Monitoring .....	10-43
10.4.8 Step 6: Verification and Certification.....	10-43
10.4.8.1 Verify and Certify Emissions Reductions (CERs) .....	10-43
10.4.8.2 Issuance of Certified Emissions Reduction .....	10-44
10.5 Potential baselines and CDM eligible projects.....	10-44
11 OPERATIONALIZATION OF THE EA FRAMEWORK .....	11-1
11.1 Proposed enforcement mechanism.....	11-1
11.2 Capacity building in environmental management.....	11-3
11.2.1 Workshops .....	11-3
11.2.2 Technical assistance .....	11-5
11.2.3 Annual participative review.....	11-5
11.3 Preliminary budget to operationalize the EA framework.....	11-5

**MODULE 4**

APPENDIX 1	Bibliography
APPENDIX 2	List of consulted stakeholders
APPENDIX 3	Public consultation in the environmental assessment process
APPENDIX 4	Content of an environmental screening form
APPENDIX 5	Typical TOR for the EIA of category A power projects
APPENDIX 6	Involuntary resettlement
APPENDIX 7	Indigenous peoples
APPENDIX 8	Accident Risk Management
APPENDIX 9	Examples of Sustainable criteria and CDM guidelines
APPENDIX 10	Baseline emissions calculations for power grids and net emissions reductions calculations

	page
Table 2.1	Area of the Nile River basin by country..... 2-1
Table 4.1	EA-related issues of regional power projects..... 4-1
Table 4.2	National institutions concerned by the EA framework for power projects ..... 4-20
Table 5.1	World Bank Safeguard Policies potentially applicable to power projects ..... 5-2
Table 6.1	Matrix of Energy and the MDGs in Africa..... 6-2
Table 7.1	Criteria assigning Category A to power projects ..... 7-17
Table 7.2	Situations triggering safeguard policies other than OP 4.01 and subsequent actions to undertake..... 7-19
Table 7.3	EA instruments for regional power projects ..... 7-20
Table 7.4	Administrative procedure of environmental screening (steps 1 & 2) ..... 7-21
Table 7.5	Administrative procedure of environmental scoping (step 3)..... 7-23
Table 7.6	Administrative procedure of environmental assessment (step 4) ..... 7-30
Table 7.7	Administrative procedure of the review and decision-making (steps 5 & 6) ..... 7-35
Table 7.8	Administrative procedure of the ESMP implementation (step 7) ..... 7-39
Table 7.9	Administrative procedure of project auditing (step 8) ..... 7-42
Table 7.10	EA framework implementation responsibilities..... 7-43
Table 8.1	Potential impacts, mitigation and enhancement measures common to regional power projects – construction phase..... 8-3
Table 8.2	Potential impacts, mitigation and enhancement measures specific to hydroelectric projects ..... 8-13
Table 8.3	Potential impacts, mitigation and enhancement measures specific to thermal power projects ..... 8-21
Table 8.4	Potential impacts, mitigation and enhancement measures specific to geothermal power projects ..... 8-26
Table 8.5	Potential impacts, mitigation and enhancement measures specific to power transmission lines ..... 8-32
Table 9.1	Atmospheric and liquid rejects indicators - World Bank maximum values..... 9-18
Table 9.2	Ambient air quality indicators of different world standing institutions..... 9-19

	page
Table 10.1	Summary of PCF Financial Contributions to Selected CDM Projects..... 10-11
Table 10.2	NBI countries and climate change ..... 10-21
Table 10.3	Overview of Project Cycle, showing official timelines and responsibilities..... 10-29
Table 10.4	Project screening criteria ..... 10-30
Table 10.5	Baseline methodologies for CDM Power Projects..... 10-34
Table 10.6	Overview of Emissions Reductions Calculation ..... 10-36
Table 10.7	Identification of potential baseline scenarios and eligible projects based on the strategic power investment plans ..... 10-45
Table 11.1	Preliminary budget to operationalize the EA framework..... 11-7

---

	page
Figure 2.1 Nile River basin .....	2-3
Figure 3.1 Hydro scheme for the existing hydropower plants in Egypt.....	3-2
Figure 3.2 Map of Sudanese Grid .....	3-4
Figure 3.3 Existing and Committed Hydropower Plants in Ethiopia .....	3-7
Figure 3.4 Regional development of power and transmission requirements to 2015 in NEL countries .....	3-13
Figure 7.1 Illustration of an environmental impact .....	7-5
Figure 7.2 General EIA Process.....	7-7
Figure 7.3 Environmental Assessment Process for Regional Power Investment Projects .....	7-9
Figure 7.4 Main steps of the EA process for regional power projects .....	7-12
Figure 7.5 Organisational chart of the EA process .....	7-45
Figure 9.1 Comparison of LCA and EIA .....	9-1
Figure 9.2 Typical Life Cycle (simplified model) for electrical power projects.....	9-3
Figure 9.3 LCA in the EA process for regional power projects.....	9-6
Figure 9.4 Simplified procedures for inventory analysis.....	9-12
Figure 10.1 Evaluation procedure .....	10-17
Figure 10.2 CDM into the EA process for regional power projects.....	10-28
Figure 11.1 Enforcement of the EA framework for regional power projects .....	11-2

Box 6.1	Guiding principles for the ecological sustainability of power projects .....	6-6
Box 6.2	Guiding principles for the social sustainability of changes in the access to natural resources.....	6-9
Box 6.3	Guiding principles for the social sustainability of resettlement.....	6-11
Box 6.4	Guiding principles of the social sustainability for indigenous communities .....	6-13
Box 6.5	Guiding principles to link gender equity and social sustainability .....	6-16
Box 6.6	Guiding principles to link health and social sustainability .....	6-18
Box 6.7	Guiding principles to link physical cultural resources and social sustainability.....	6-19
Box 6.8	Guiding principles to link public consultation and social sustainability.....	6-22
Box 6.9	Guiding principles to take into account economic aspects of projects sustainability.....	6-24
Box 6.10	Guiding principles to improve positive impacts of power projects on local communities.....	6-25
Box 7.1	Contents of a Project Notice .....	7-13
Box 7.2	Contents of a Project Notice Analysis.....	7-14
Box 7.3	Involuntary resettlement at the screening step.....	7-18
Box 7.4	Indigenous peoples at the screening step.....	7-18
Box 7.5	Contents of an EIA Report.....	7-27
Box 7.6	Contents of an ESMP .....	7-29
Box 7.7	EIA review criteria.....	7-32
Box 10.1	Transaction costs .....	10-8
Box 10.2	Key international criteria .....	10-15
Box 10.3	Key national elements which should be evaluated.....	10-16
Box 10.4	Capacity building opportunities areas .....	10-18
Box 10.5	Political and technical prerequisites to create a DNA.....	10-19
Box 10.6	Criteria that can be used for CDM project screening.....	10-23

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AfDB	African Development Bank
BP	Bank Procedure
Bkwh	Billion kilowatt-hours
BOT	Build-Operate-Transfer
CER	Certified emissions reduction
CDD	Community Driven Development
CDM	Clean Development Mechanism
CH <sub>4</sub>	Methane
CIDA	Canadian International Development Agency
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
COP	Convention of Parties
DNA	Designated National Authority
DOE	Designated Operational Entity
DRC	Democratic Republic of Congo
EA	Environmental Assessment
EAC	East African Community
EB	Executive Board
EC	European Commission
EEAA	Egyptian Environmental Affairs Agency
EEHC	Egyptian Electricity Holding Co
EPCO	Ethiopian Electric Power Corporation
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ENSAP	Eastern Nile Subsidiary Action Programs
ENTRO	Eastern Nile Technical Regional Office
ESA	Environmental Sensitive Area
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EU	European Union
EWRMP	Ethiopia's Water Resource Management Policy
FA	Funding agency
FEMA	Forum of Energy Ministers of Africa
GHG	Greenhouse gas
GIS	Geographic Information System
GW	Gigawatts

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GWP	Global Warming Potential
HCENR	High Council of Environment and Natural Resources
HFC	Hydrofluorocarbone
HIA	Health Impact Assessment
HIPC	Heavily Indebted Poor Countries
H <sub>2</sub> S	Hydrogen sulphide gas
IHA	International Hydropower Association
IMF	International Monetary Fund
IPCC	International Panel on Climate Change
IPP	Independent Power Project
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory
LCIA	Life cycle impact assessment
LPG	Lamp Petroleum and Gas
MDGs	Millennium Development Goals
MW	Megawatts
MWRI	Ministry of Water Resources and Irrigation
M&V	Monitoring and verification
NA	National Authority
NAPA	National Adaptation Programme of Action
NBI	Nile Basin Initiative
NC	National Communication
NCCSC	National Climate Change Steering Committee
NEA	National Environmental Authority
NEAP	National EA Process
NEC	National Electricity Corporation
NELSAP	Nile Equatorial Lakes Subsidiary Action Program
NEMA	National Environmental Management Authority
NEMC	National Environment Management Council
Nile-COM	Nile Council of Ministers
Nile-SEC	Secretariat of the Nile Basin
Nile-TAC	Nile Technical Advisory Committee
NELSAP	Nile Equatorial Lakes Regions Subsidiary Action Programs
NGO	Non governmental organization
NGP	National Gender Policy



NO <sub>x</sub>	Nitrogen oxides
OE	Operational Entity
OECD	<i>Organisation de Coopération et de Développement Économiques</i>
PAP	Project affected people
PCF	Prototype Carbon Fund
PDD	Project Design Document
PFC	Perfluorocarbon
PIGU	<i>Projet d'Infrastructures et de Gestion Urbaine</i>
PMU	Project Management Unit
PMURR	<i>Programme Multisectoriel d'Urgence de Réhabilitation et de Reconstruction</i>
PP	Project Proponent
PRADECS	<i>Projet d'appui au développement communautaire et social</i>
PRASAB	<i>Projet de Réhabilitation et d'Appui au Secteur Agricole du Burundi</i>
PRSP	Poverty Reduction Strategy Paper
PUAACV	<i>Projet d'Urgence d'Appui à l'Amélioration des Conditions de Vie</i>
RAP	Resettlement Action Plan
REAWG	Regional Environmental Assessment Working Group
REAP	Regional EA Process
REGIDESO	<i>Régie de Production et de Distribution de l'Eau et de l'Électricité</i>
RPT	Regional Power Trade
RPTP	Regional Power Trade Project
SAP	Subsidiary Action Programs
SAPP	Southern African Power Pool
SD	Sustainable Development
SEA	Strategic Environmental Assessment
SF <sub>6</sub>	Sulphur hexafluoride
SSEA	Strategic/Sectoral, Social and Environmental Assessment
STD	Sexually transmitted diseases
SO <sub>2</sub>	Sulphur dioxide
SVP	Shared Vision Program
TANESCO	Tanzania Electric Supply Company Ltd
TOR	Terms of reference
TRC	Technical Review Committee
UN	United Nations
UNEP	United Nations Environmental Program
UNDP	United Nations Development Program

UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization

**Compensation**

Monetary payment or replacement in kind for an asset (or a resource) to be acquired or affected by a project at full replacement cost that is, the market value of the assets plus transaction costs without considering the depreciation of the asset.

**Elementary flow**

Material or energy entering or leaving the product system without human transformation.

**Environment**

Organised and dynamic system evolving over time and including biophysical and human factors and in which living organisms act and where human activities take place.

**Environmental aspect or emission**

Element of the product system that can interact with the environment.

**Environmental assessment (EA)**

Systematic process for evaluating and documenting the capacities and functions of resources and of natural and human systems in order to facilitate the planning of sustainable development and the decision process in general, as well as forecasting and managing negative impacts and the consequences of development proposals.

**Environmental audit**

An instrument to determine the nature and extent of all environmental areas of concern at an existing facility. The audit identifies and justifies appropriate measures to mitigate the areas of concern, estimates the cost of the measures, and recommends a schedule for implementing them (World Bank OP 4.01 Annex A).

**Environmental impact**

Effect, for a period of time and within a specific space, of a human activity on an environmental or human component, compared with the “without project” situation.

**Environmental impact assessment (EIA)**

Instrument to examine the environmental consequences, both beneficial and adverse, of a proposed development project and to ensure that these consequences are taken into account in project design.

**Environmental and social management plan (ESMP)**

Instrument that outlines the measures to prevent, minimise, mitigate or compensate for adverse environmental impacts and to enhance beneficial impacts. It specifies how, when and by whom these measures shall be implemented.

**Environmental monitoring**

Step of the EA process consisting to ensure that the environment is respected and that the mitigation measures required are applied during construction and operation of the project.

**Health**

A complete state of physical and mental well being and not merely the absence of disease and infirmity.

**Involuntary resettlement**

All direct economic and social losses resulting from land taking and restriction of access, together with the consequent compensatory and remedial measures. Resettlement can, depending on the case, include (a) acquisition of land and physical structures on the land, including businesses; (b) physical relocation; and (c) economic rehabilitation of displaced persons, to improve (or at least restore) incomes and living standards (World Bank's *Involuntary Resettlement Sourcebook*).

**Life cycle**

Consecutive and interlinked stages of a product system from raw material acquisition or generation of natural resources to the final disposal.

**Life cycle assessment**

Compilation and evaluation of the inputs, outputs and potential environmental impacts of production system throughout its life cycle.

**Mitigation**

Activity aimed at reducing the severity, avoiding or controlling environmental impact of a project.

**Person affected by a project**

Any person (individual, household or community) who, as a result of the implementation of a project, loses the right to own, use, or benefit from a built structure, land (residential, agricultural, or pasture), annual or perennial crops and trees, or any other fixed or moveable asset, either in full or in part, permanently or temporarily.

**Physical displacement**

Loss of housing and assets resulting from the acquisition of land associated with a project that requires the affected person(s) to move to another location.

**Product system**

Collection of materially and energetically connected unit processes which forms one or more defined functions.

**Project area of influence**

The area likely to be affected by the project, including all related facilities, such as power transmission corridors, pipelines, canals, tunnels, relocation and access roads, borrow and disposal areas, and construction camps, as well as unplanned developments induced by the project.

**Resettlement action plan**

The document in which a project proponent or other responsible entity specifies the procedures that it will follow and the actions that it will take to mitigate adverse effects, compensate losses, and provide development benefits to persons and communities affected by a project.

**Risk assessment**

Instrument for estimating the probability of harm occurring from the presence of dangerous conditions or materials at a project site.

**Stakeholder**

All individuals, groups, organizations, and institutions interested in and potentially affected by a project or having the ability to influence a project.

**Transboundary impact**

Any impact, not exclusively of a global nature (such as climate change, ozone depletion, biodiversity, etc.), within an area under the jurisdiction of a country caused by a proposed activity which the physical origin is situated wholly or in part within the area under the jurisdiction of another country.

**Vulnerable group**

Distinct group of persons characterised by a higher risk and reduced ability to cope with adverse impacts by virtue of gender, ethnicity, age, physical or mental disability, economic disadvantage, or social status.



# MODULE 1

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## Executive Summary / Résumé





## EXECUTIVE SUMMARY

### Background

The Nile riparian countries (Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda) established in February 1999 the Nile Basin Initiative (NBI) to address common concerns and interests, particularly poverty alleviation. The Vision of the NBI is to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the Nile basin water resources. To translate this Vision into action, the NBI includes two main components: a basin-wide Shared Vision Program (SVP) and Subsidiary Action Programs (SAP).

The Regional Power Trade Project (RPTP) is one of the components of the Shared Vision Program. The RPTP is to be implemented basin-wide to help establish a foundation for transboundary regional cooperation and to create an enabling environment suitable for investments and action on ground within an agreed basin-wide framework. The RPTP aims to establish the institutional means to coordinate the development of regional power trade and markets among the NBI countries.

The Nile Basin covers an area of nearly 3.1 million km<sup>2</sup> representing about 10% of the African continent (Figure 1). Table 1 shows the distribution of the basin within the 10 riparians countries. The two downstream countries of the basin, Sudan and Egypt, encompass 63% and 10% of the Nile river basin. At the opposite, upstream countries such as Burundi, DRC and Rwanda occupy each less than 1% of the basin.

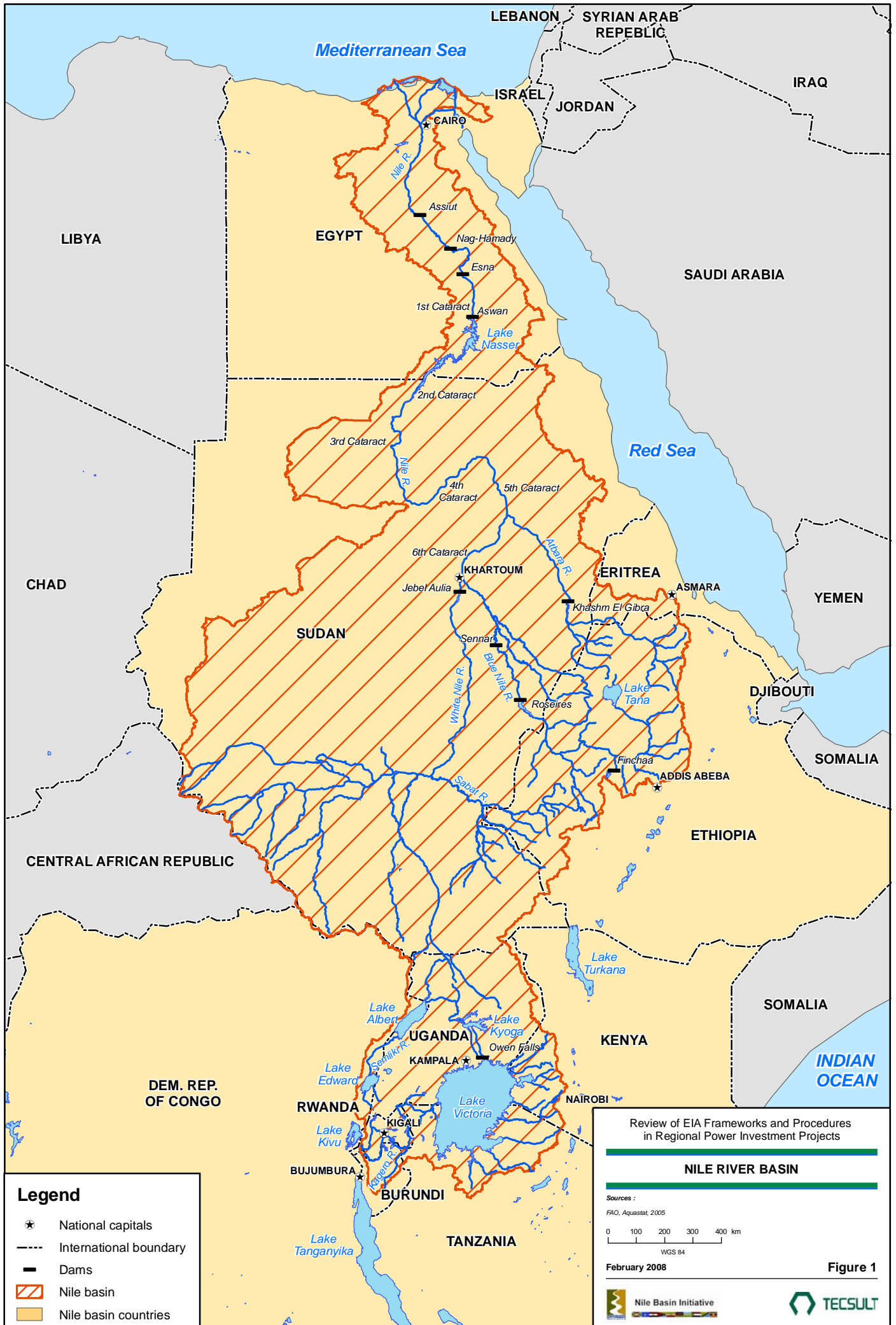
**Table 1 Area of the Nile River basin by country**

Country	Total area (km <sup>2</sup> )	Basin area in country (km <sup>2</sup> )	% of the country	% of the basin
Burundi	27 834	14 318	51.4	0.5
DRC	2 345 000	28 180	1.2	0.9
Egypt	995 450	304 246	30.6	9.8
Eritrea	121 320	24 699	20.4	0.8
Ethiopia	1 127 127	349 625	31.0	11.3
Kenya	582 650	44 599	7.7	1.4
Rwanda	26 338	20 917	79.4	0.7
Sudan	2 505 810	1 947 683	77.7	63.0
Tanzania	945 087	115 219	12.2	3.7
Uganda	250 066	241 359	96.5	7.8
<b>Total</b>	<b>8 926 682</b>	<b>3 090 844</b>	<b>34.6</b>	<b>100.00</b>

In the Nile basin region, cheap and reliable supply of electricity is a critical input for economic growth, employment generation and poverty alleviation. The power sector in the NBI countries is quite diversified, but in general does not meet the total demand in power. It includes a variety of hydropower, thermal power and geothermal power facilities, as well as power transmission lines and some interconnections. Table 2 below presents a synopsis of the existing situation in the NBI countries, and potential power investment plans as identified in the major power master plans.

**Table 2 Power sector in the NBI countries**

<b>Countries</b>	<b>Current energetic picture</b>	<b>Strategic energetic investment plans</b>
Burundi	100% hydroelectric	100% hydroelectric
Democratic Republic of Congo	84.3% hydroelectric 15.7% thermal	52.3% methane (Kivu Lake) 47.7% hydroelectric
Egypt	86% thermal 13% hydroelectric 1% wind	69.3% natural gas 21.5% wind 8.2% nuclear 1% hydroelectric
Ethiopia	87.4% hydroelectric 11.6% thermal 1% geothermal	97.4% hydroelectric 2.6% coal
Kenya	58.3% hydroelectric 17.9% diesel 11.3% geothermal 10.1% gas 2.3% steam	45.6% coal 42.4% geothermal 6% natural gas 6% wind
Rwanda	75.6% hydroelectric 24.4% diesel	57.8% hydroelectric 42.2% methane (Kivu Lake)
Sudan	59% thermal 41% hydroelectric	45.5% hydroelectric 36.8% gas oil 17.2% HFO 0.5% diesel
Tanzania	70.7% hydroelectric 29.3% thermal	31.1% natural gas 1% diesel 67.9% hydroelectric
Uganda	97.5% hydroelectric 2.5% thermal	100% hydroelectric



Review of EIA Frameworks and Procedures in Regional Power Investment Projects

**NILE RIVER BASIN**

Sources :

FAO, Aquastat, 2005

0 100 200 300 400 km  
WGS 84

February 2008

**Figure 1**





## **Environmental assessment frameworks of NBI countries and funding agencies**

The level of detail of the environmental assessment (EA) procedures and frameworks of the Nile basin countries varies significantly from one country to another. Some countries such as Egypt and Ethiopia do have comprehensive EA regulations and guidelines, whereas in some other countries (Burundi and Rwanda for example), EA is essentially based on the general principles stated by the Law. Key social issues, such as resettlement, indigenous communities, gender and cultural heritage, are not necessarily covered by EIA frameworks of each country. Considering the NBI's Vision which is to achieve sustainable socio-economic development, the key social issues shall be properly taken into account while evaluating specific regional power projects in the NBI countries.

No specific framework for power projects exists in the Nile basin countries. However, in Ethiopia and Egypt for example, there are some EIA guidelines for power projects that can be considered at the same level as international best practices.

In general, EA frameworks of funding agencies, especially World Bank and European Union, are much more detailed and restricting than frameworks of NBI countries. Apart from general EIA guidelines, the funding agencies do not also have specific EA frameworks for regional power projects. The International Hydropower Association (IHA) has a set of comprehensive sustainability guidelines for new and existing hydropower projects.

Considering the diversity of EA procedures and frameworks of the NBI countries, funding agencies and international initiatives, as well as the potential transboundary power projects in the pipeline, it is justified to develop and enforce a comprehensive standard framework of integrated environmental and social impact assessment, applicable to all regional power projects in the NBI countries, inspired from international and regional initiatives, and complying with international practices and NBI countries' policies and regulations.

## **Components of the EA framework for regional power projects**

The main objective of this EA framework, which integrates environmental and social issues of power projects, is to contribute to NBI's vision, which is to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the Nile basin water resources. Another objective is to plan and implement the regional power projects according to best practices as far as sustainable development is concerned.

In this EA framework, guiding principles to achieve sustainable development through regional power projects cover ecological, social and economic aspects of projects sustainability. These guiding principles take into consideration the achievement of the Millennium Development Goals and important issues such as biodiversity, involuntary resettlement, changes to the environment and resource use in the area, indigenous communities, gender issues, public health issues, economic development, physical cultural resources, participation and consultation of the stakeholders, and positive impacts of the power projects on local communities.

In order to integrate all these ecological, social and economic guiding principles in the projects' cycle phases, a comprehensive environmental assessment process has been elaborated (see Figure 2). The EA process for NBI regional power projects complies with the general environmental impact assessments that are applied by most national environmental agencies and funding agencies, notably the World Bank and the African Development Bank. It follows the project cycle phases: i) identification; ii) preparation; iii) appraisal and approval; iv) implementation and supervision; v) post-evaluation. Eight steps are defined for the EA process: 1) pre screening; 2) screening; 3) scoping; 4) impact assessment; 5) review; 6) decision-making; 7) ESMP implementation and; 8) auditing.

At the project identification phase, the EA screening consists to determine if the power project is subjected to the Regional EA Process (REAP). Hydropower, thermal, geothermal and transmission lines projects are subjected to the REAP if i) The project affects or provides benefits to at least two NBI countries; ii) The project is likely to cause significant adverse transboundary impacts; or iii) The project is likely to cause significant adverse impacts on an international heritage site. In any case that the REAP is triggered, it is not necessary to duplicate the process by implementing the NEAP, because the REAP harmonizes the EA requirements of all NBI countries and funding agencies in general. The screening of the project consists also to determine the category of the project and therefore, the types of environmental and social studies to be carried out before decision-making.

At the project preparation phase, the objective of environmental scoping is to prepare the Terms of Reference (TOR) of the environmental and social studies in accordance with applicable national legislation and policies of the funding agency such as World Bank safeguard policies, while consulting affected groups and local NGOs. The NEA of the project country of origin approves the TOR prepared by the project proponent.

**Figure 2 Organisational chart of the EA process**

	Project Proponent (PP)	National Environmental Agency (NEA)	Regional EA Working Group (REAWG)	Funding Agency (FA)	Technical Review Committee (TRC)	Nile Technical Advisory Committee (Nile TAC)
Step 1 Pre-screening	Preparation of the power project notice	Screening of the project against NEAP and REAP triggering criteria				
↓			Determination of the project category Identification of the documents to prepare	Non-objection		
↓	Consultation of affected groups and local NGOs Preparation of the TOR for required documents	Consultation of affected groups and local NGOs Approval of the scoping				
↓	Preparation of the studies Public consultations	Review of compliance				
↓	External review Completion of the studies	External review		Internal review of the studies	Internal review of the studies	
↓	Appeal in case of disputed decision	Recommendation for decision Deliverance of the environmental permit	Review of the process and decision	Non-objection		Appeal in case of disputed decision
↓	ESMP implementation reporting	Control of the ESMP implementation		Supervision		
↓	Preparation of the environmental and social audit	Review of the audit				

The impact assessment step comprises three main activities: 1) preparation of the studies; 2) further public consultations and; 3) review of compliance. Category A projects require a full Environmental Impact Assessment (EIA), an Environmental and Social Management Plan (ESMP), a Life Cycle Assessment (LCA). The EA of a Category B project may include a limited EIA or only an ESMP. Most social issues triggered by power and interconnection projects will be integrated in the terms of references of the EIA. However, it is likely that a Resettlement Action Plan (RAP) will be required for most NBI projects at the EIA stage. In some cases, indigenous people issues may also require special studies.

At the project appraisal and approval phase, the review of the studies comprises : 1) Internal review of the studies, including the national approval of a Clean Development Mechanism (CDM) project; 2) External review through disclosure and public consultation; 3) Completion of the studies; and 4) Decision making. This decision may be to authorize the project, with or without changes and under some conditions, or to turn down the project, and submitted to the funding agency for non-objection. Finally, it is important to ensure that the environmental recommended measures be integrated in the tender and contracting documents.

At the ESMP implementation phase, step 7 of the EA process consists basically to ensure, during the whole life of the power project, that the measures identified to offset, mitigate or compensate the environmental and social adverse impacts are properly executed. Finally, at the project post-evaluation phase, the last step of the EA process include: 1) Environmental and social audit; and 2) Review of the audit. Environmental auditing is an objective examination of whether or not practice complies with expected standard.

In order to facilitate the identification and mitigation of the environmental and social impacts of regional power projects during the preparation of EIAs of such projects in the NBI countries, this EA framework identifies issues to consider for hydropower, thermal and geothermal power, as well as for power transmission lines.

As far as hydroelectric projects are concerned, the operation of dams and reservoirs include several activities or components that can potentially induce significant environmental and social impacts. Issues include changes in the river system, fisheries and wildlife, non-resident workers, agriculture and resettlement. Since this type of project often involves important land acquisition and involuntary resettlement, the project design shall be based on a comprehensive analysis of alternatives.



Environmental impacts from thermal power plant operation normally include those on ambient air, water and soil quality, and the disposal of solid wastes. Impacts on vegetation, wildlife, local populations, and the health and safety of workers must also be considered.

On the environmental point-of-view, geothermal energy offers a number of advantages over fossil fuel used by thermal power plants. Indeed, geothermal energy is clean and safe for the surrounding environment. Moreover, geothermal energy is competitive on the economic standpoint and reduces reliance on costly fossil fuels.

Power transmission and distribution lines can open up remote lands to human activities such as settlement, agriculture, hunting, recreation, etc. Construction of the power line right-of-way can result in the loss and fragmentation of habitat and vegetation along the line. These effects can be significant if natural areas, such as wetlands or natural forests are affected, or if the newly-accessible lands are the home of indigenous peoples.

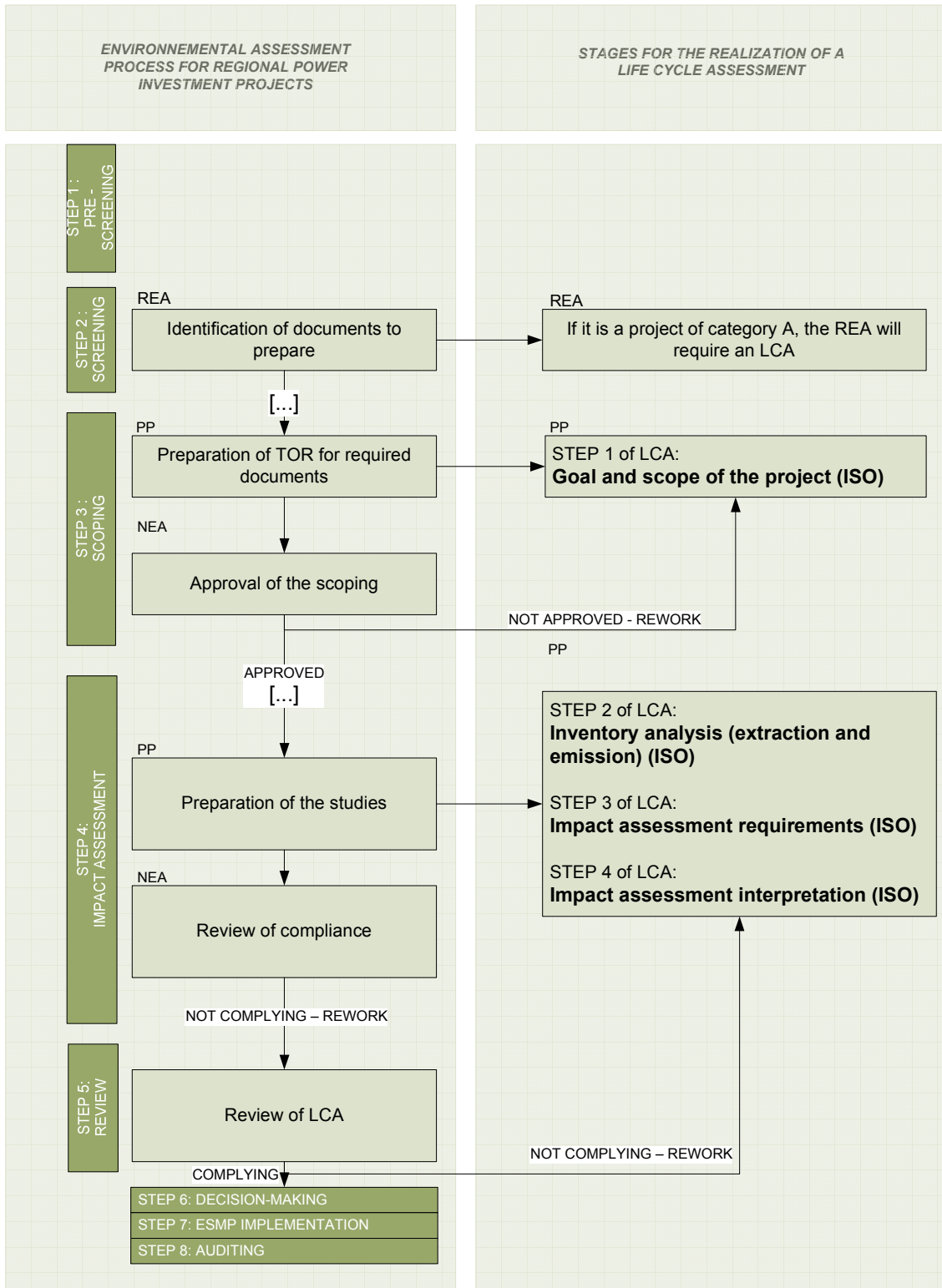
To better guide the preparation of environmental studies on regional power projects, it will be important that detailed EIA guidelines for power sector activities be prepared based on this EA Framework in the near future in order to harmonise the contents of the future studies.

### **Life Cycle Assessment**

This EA framework considers also the integration of Life Cycle Assessment (LCA) in the EA of a regional power project. This approach is quite innovative but also interesting considering that, on a spatial scale, LCA is a global process encompassing the project from “cradle to grave”, which makes it complementary to the EIA studies. The LCA study needs to cover the various stages of the project life cycle, namely extraction and preparation of the raw materials and energy; construction of infrastructures, machines and inputs, as well as transportation; main production phase (in this case: electricity production) and transportation; waste processing; and finally decommissioning of the plant.

LCA is divided into 4 steps: 1) identification of the goal and scope, 2) inventory analysis, 3) impact assessment requirements, and 4) impact assessment interpretation. Figure 3 shows the relation between LCA and the EA process for regional power projects.

**Figure 3 Life cycle assessment in the EA process**



## **Clean Development Mechanism**

The Clean Development Mechanism (CDM), developed under the umbrella of the Kyoto Protocol, is of greatest interest to the developing world because it allows channelling foreign investment to these countries to promote sustainable development and abate greenhouse gas emissions while generating certified emission reduction units (CERs) that industrialized nations can apply towards meeting their own emission reduction targets. To be eligible to CDM funds a project have to lead to real and measurable GHG emissions reductions, to result in additional GHG emissions reductions, and to contribute to sustainable development in the host country. Besides, more than one country can host an eligible project.

In most cases, selling certified emission reduction units (CERs) through the CDM will provide only part of the financing necessary for the project. Thus this source of “carbon financing” will still need to be completed with conventional financing (full or partial equity, financial contribution, loan or certified emissions reduction purchase agreement).

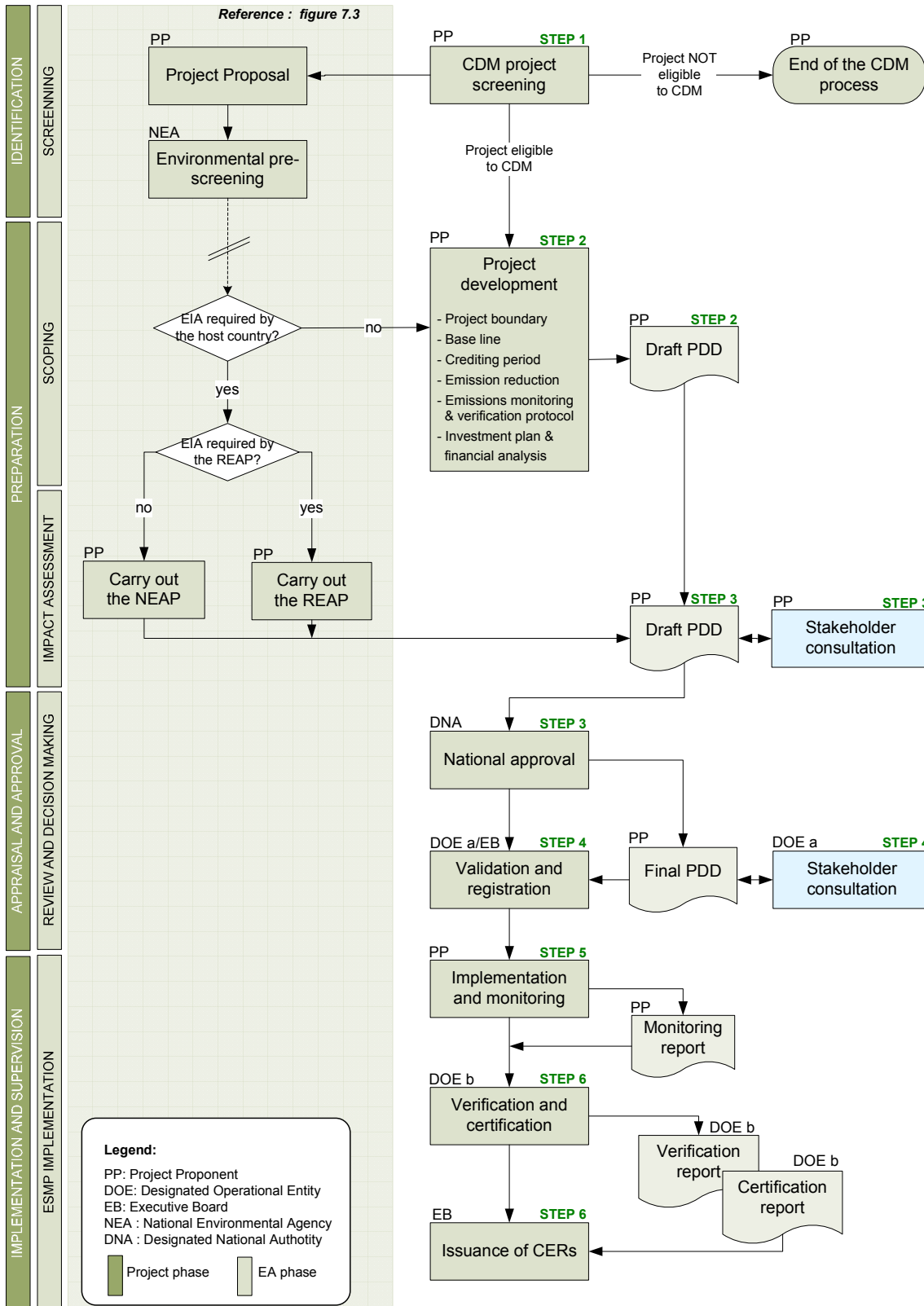
Figure 4 presents an overview of the integration of CDM in the EA process for regional power projects. During the whole process, the proponent will have to constitute a Project Design Document (PDD) which will be evaluated in turn by the Designated National Authority and the Executive Board (EB) of CDM. Designated Operational Entities (DOE) will have to report to the EB on the content of the PDD, and on the monitoring of emissions reductions before the first CERs being issued by the EB.

One of the first and the most crucial elements of the PDD is the baseline scenario. The baseline of a project is a measure of the emissions that would have occurred in the absence of the proposed project activity, and is used to estimate the emissions reductions from the project. Table 3 identifies the potential baseline scenarios in the NBI countries and therefore, the eligible projects based on the strategic power investment plans.

## **Operationalization of the EA framework**

The process to enforce the EA framework for regional power projects is illustrated on Figure 5. The proposed enforcing Protocol shall be ratified by each NBI country, through regulations signed by the Minister in charge of Environment.

**Figure 4 CDM in the EA process**



**Table 3 Potential baseline scenarios and eligible projects based on the strategic power investment plans**

Countries	Typical baseline scenario	Potential energy power generation project
Burundi <sup>(1)</sup>	Hydroelectric power plant	Renewable energies (wind power, solar power, biomass...)
Democratic Republic of Congo <sup>(1)</sup>	Methane gas power plant	Renewable energies (wind power, solar power, biomass...) Hydroelectric Geothermal
Kenya <sup>(1)</sup>	Coal fired power plant	Renewable energies (wind power, solar power, biomass...) Hydroelectric Geothermal Natural gas
Rwanda <sup>(1)</sup>	Methane gas power plant	Renewable energies (wind power, solar power, biomass...) Hydroelectric Geothermal
Tanzania <sup>(1)</sup>	Natural gas power plant	Renewable energies (wind power, solar power, biomass...) Hydroelectric Geothermal
Uganda <sup>(1)</sup>	Hydroelectric power plant	Renewable energies (wind power, solar power, biomass...)
Egypt <sup>(2)</sup>	Natural gas power plant	Renewable energies (wind power, solar power, biomass...) Hydroelectric Geothermal
Ethiopia <sup>(2)</sup>	Coal fired power plant	Renewable energies (wind power, solar power, biomass...) Hydroelectric Geothermal Natural gas
Sudan <sup>(2)</sup>	HFO <sup>(3)</sup> or gas oil fired plant	Renewable energies (wind power, solar power, biomass...) Hydroelectric Geothermal Natural gas

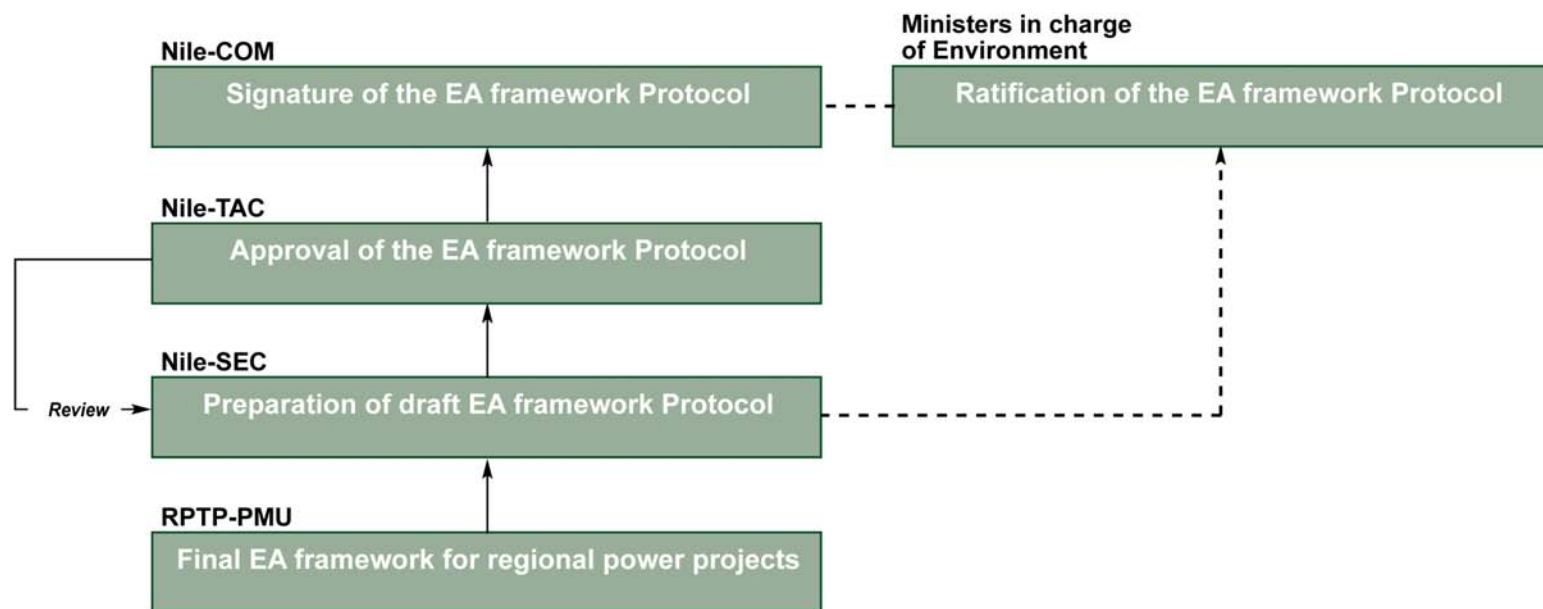
<sup>(1)</sup> Source: Strategic/Sectoral, Social and Environmental Assessment of Power Development Options in the Nile Equatorial Lakes Region, SNC Lavalin International, February 2007

<sup>(2)</sup> Source: Eastern Nile Power Trade Program Study, EDF – Generation and Engineering Division, March 2007

<sup>(3)</sup> HFO: heavy fuel oil

In order to ensure the implementation of the EA framework and based on a comprehensive institutional analysis, it is essential that the concerned staff of the institutional organisations involved in the process be trained and become familiar with the components of the EA framework. This EA framework proposes a preliminary capacity building program that will have to be validated by the proposed analysis of NBI countries environmental institutions.

The preliminary budget required to operationalize the EA framework for regional power projects is estimated at US\$1.62 million during the 10 years following its acceptance by NBI authorities (Table 4). It is based on the assumption that 30 regional power projects will be evaluated in the next 10 years in the NBI countries.

**Figure 5** Enforcement of the EA framework for regional power projects

**Table 4 Preliminary budget to operationalize the EA framework  
 (in current US\$)**

Activities	Years										Total	
	1	2	3	4	5	6	7	8	9	10		
<b>Technical assistance</b>												
Development of the EIA protocol	75 000											75 000
Detailed ESIA guidelines (3)	95 000	97 850	100 786									293 636
<b>Capacity building</b>												
Institutional study	95 000											95 000
Workshops (3)		70 000										70 000
Technical assistance for review of EIA (desk work)		25 000										25 000
Annual review		30 000	30 900	31 827	32 782	33 765	34 778	35 822	36 896	38 003		304 773
<b>EA process implementation</b>												
Regional EA Working Group (part-time)		25 000	25 750	26 523	27 318	28 138	28 982	29 851	30 747	31 669		253 978
National Environmental Agencies (part time)		50 000	51 500	53 045	54 636	56 275	57 964	59 703	61 494	63 339		507 955
<b>Total</b>	<b>265 000</b>	<b>297 850</b>	<b>208 936</b>	<b>111 395</b>	<b>114 736</b>	<b>118 178</b>	<b>121 724</b>	<b>125 375</b>	<b>129 137</b>	<b>133 011</b>		<b>1 625 342</b>





## RÉSUMÉ

### Contexte

Les pays riverains du Nil (Burundi, République Démocratique du Congo, Égypte, Éthiopie, Kenya, Rwanda, Soudan, Tanzanie et Ouganda) ont mis en place en février 1999 l'Initiative du Bassin du Nil (NBI) pour prendre en compte leurs préoccupations et intérêts communs, notamment la lutte contre la pauvreté. La Vision du NBI est de réaliser un développement socio-économique durable par l'utilisation et le partage équitable des ressources en eau du bassin du Nil. Afin de mettre en œuvre cette Vision, le NBI comprend deux principales composantes, soit le *Shared Vision Program* (SVP) et le *Subsidiary Action Programs* (SAP).

Le *Regional Power Trade Project* (RPTP) est un des projets du *Shared Vision Program*. Le RPTP est mis en œuvre afin de mettre en place les fondations d'une coopération régionale transfrontalière et de créer un environnement propice aux investissements et aux actions sur le terrain dans un cadre commun à l'échelle du bassin versant. Le RPTP vise à établir les moyens institutionnels pour coordonner le développement d'échanges et de marchés régionaux d'électricité au sein des pays du bassin du Nil.

Le bassin du Nil couvre une superficie de près de 3,1 millions km<sup>2</sup> représentant environ 10% du continent africain (figure 1). Le tableau 1 démontre la répartition du bassin à l'intérieur des 10 pays riverains. Les deux pays à l'aval du bassin, soit le Soudan et l'Égypte, englobent respectivement 63% et 10% du bassin du Nil. À l'opposé, les pays en amont comme le, la RDC et le Rwanda occupent chacun moins de 1% de la superficie du bassin.

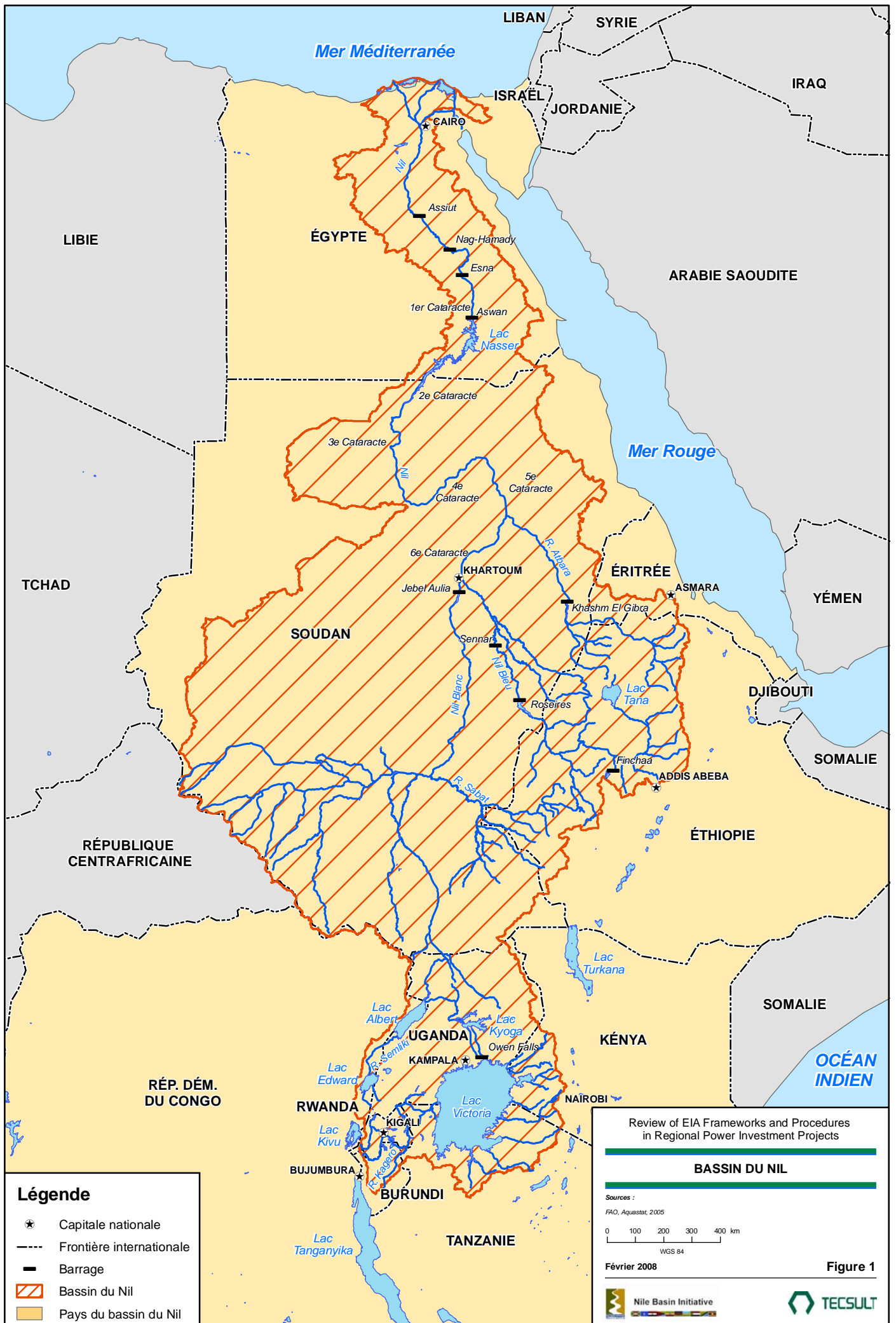
**Tableau 1 Superficie du bassin du Nil par pays**

Pays	Superficie totale (km <sup>2</sup> )	Superficie du bassin par pays (km <sup>2</sup> )	% du pays	% du bassin
Burundi	27 834	14 318	51,4	0,5
RDC	2 345 000	28 180	1,2	0,9
Égypte	995 450	304 246	30,6	9,8
Eritrée	121 320	24 699	20,4	0,8
Éthiopie	1 127 127	349 625	31,0	11,3
Kénya	582 650	44 599	7,7	1,4
Rwanda	26 338	20 917	79,4	0,7
Soudan	2 505 810	1 947 683	77,7	63,0
Tanzanie	945 087	115 219	12,2	3,7
Ouganda	250 066	241 359	96,5	7,8
<b>Total</b>	<b>8 926 682</b>	<b>3 090 844</b>	<b>34,6</b>	<b>100,00</b>

Dans les pays du bassin du Nil, l'approvisionnement fiable en électricité à prix modique est une condition essentielle à la croissance économique, la création d'emplois et la lutte contre la pauvreté. Le secteur de l'électricité dans les pays du NBI est assez diversifié, mais ne répond pas de manière générale à la demande totale en électricité. Le secteur inclut une variété de centrales hydroélectriques, thermiques et géothermiques, ainsi que des lignes de transport de l'électricité et des interconnexions. Le tableau 2 ci-dessous dresse le portrait de la situation énergétique dans les pays du bassin du Nil, et les plans d'investissements énergétiques tel qu'identifiés par les principaux plans directeurs.

**Tableau 2 Secteur de l'électricité dans les pays du bassin du Nil**

<b>Pays</b>	<b>Situation énergétique</b>	<b>Plan d'investissements énergétiques</b>
Burundi	100% hydroélectrique	100% hydroélectrique
RDC	84,3% hydroélectrique 15,7% thermique	52,3% méthane (Lac Kivu) 47,7% hydroélectrique
Égypte	86% thermique 13% hydroélectrique 1% éolien	69,3% gaz naturel 21,5% éolien 8,2% nucléaire 1% hydroélectrique
Éthiopie	87,4% hydroélectrique 11,6% thermique 1% géothermique	97,4% hydroélectrique 2,6% charbon
Kenya	58,3% hydroélectrique 17,9% diesel 11,3% géothermique 10,1% gaz naturel 2,3% vapeur	45,6% charbon 42,4% géothermique 6% gaz naturel 6% éolien
Rwanda	75,6% hydroélectrique 24,4% diesel	57,8% hydroélectrique 42,2% méthane (Lac Kivu)
Soudan	59% thermique 41% hydroélectrique	45,5% hydroélectrique 36,8% gaz naturel 17,2% HFO 0,5% diesel
Tanzanie	70,7% hydroélectrique 29,3% thermique	31,1% gaz naturel 1% diesel 67,9% hydroélectrique
Ouganda	97,5% hydroélectrique 2,5% thermique	100% hydroélectrique





## **Cadres d'évaluation environnementale des pays du NBI et des bailleurs de fonds**

Le niveau de détails des procédures d'évaluation environnementale et sociale des pays du bassin du Nil varie grandement d'un pays à l'autre. Certains pays tels que l'Égypte et l'Éthiopie ont des réglementations et directives détaillées alors que dans d'autres pays comme le Burundi et le Rwanda, l'évaluation d'impact environnemental est essentiellement basée sur des principes généraux définis par la loi. Les enjeux sociaux importants, tels que la réinstallation involontaire des populations, les communautés autochtones, le genre et le patrimoine culturel ne sont pas systématiquement couverts par les procédures des pays membres du NBI. Considérant la Vision du NBI qui est de réaliser un développement socio-économique durable, ces enjeux doivent être adéquatement considérés lors de l'évaluation des projets régionaux de production électrique dans les pays du NBI.

Généralement, les cadres d'évaluation environnementale des bailleurs de fonds, notamment ceux de la Banque mondiale et de l'Union Européenne, sont nettement plus détaillés et restrictifs que ceux des pays membres du NBI. Cependant, il n'existe pas, au niveau des bailleurs de fonds de cadres spécifiques d'évaluation environnementale de projets régionaux de production électrique. Toutefois, l'Association Internationale d'Hydroélectricité (IHA) dispose d'un ensemble de directives applicables aux projets hydroélectriques.

Compte tenu de la diversité des cadres de gestion et des procédures d'évaluation environnementale des pays membres du NBI, des bailleurs de fonds et des initiatives internationales, de même que les impacts transfrontaliers des projets d'électricité en préparation, il apparaît opportun de développer et d'instaurer un cadre d'évaluation environnementale (CÉE) applicable à tous les projets régionaux de production d'électricité.

## **Composantes du cadre d'évaluation environnementale proposé**

Le principal objectif de ce CÉE, qui intègre les problématiques environnementales et sociales, est de contribuer à l'application de la vision du NBI sur le développement socio-économique durable par l'utilisation et le partage équitable des ressources en eau du bassin du Nil. Par ailleurs, le CÉE vise à planifier et mettre en œuvre des projets régionaux d'électricité conformes aux bonnes pratiques de développement durable.

Dans le cadre de ce CÉE, les principes directeurs de développement durable à travers les projets régionaux d'électricité concernent les aspects écologiques, sociaux et économiques

de la durabilité des projets. Ces principes prennent en considération les objectifs du Millénaire pour le Développement des Nations Unies et d'importants enjeux tels que la biodiversité, la réinstallation involontaire, les changements dans l'environnement et l'utilisation des ressources naturelles, les populations autochtones, les questions de genre, la santé publique, le patrimoine culturel, la participation et la consultation des populations et les impacts positifs des projets de production électrique sur les communautés locales.

Afin d'intégrer ces principes directeurs du développement durable dans le cycle du projet, un processus détaillé d'évaluation environnementale (ÉE) a été élaboré (voir figure 2). Le processus d'ÉE pour les projets régionaux de production électrique est conforme aux principes d'évaluation environnementale appliqués par les agences environnementales des pays du NBI et les bailleurs de fonds, notamment la Banque Mondiale et la Banque Africaine de Développement. Il décrit chacune des étapes durant le cycle du projet: i) identification; ii) préparation; iii) analyse et approbation; iv) mise en œuvre et supervision; v) évaluation. Le processus comporte huit étapes : 1) tri préliminaire; 2) tri; 3) cadrage; 4) évaluation environnementale; 5) analyse; 6) prise de décision; 7) mise en œuvre du Plan de Gestion Environnementale et Sociale (PGES) ; 8) vérification environnementale (audit).

À la phase d'identification du projet, le tri préliminaire consiste à déterminer si le processus régional d'ÉE s'applique au projet à l'étude. Les projets hydroélectriques, thermiques, géothermiques et de lignes de transport d'énergie sont soumis à ce processus s'ils : i) affectent ou bénéficient à au moins deux pays; ii) risquent d'avoir des impacts transfrontaliers ou; iii) peuvent avoir un impact sur un site du patrimoine mondial. Si le processus régional s'applique, il n'est pas nécessaire de le dupliquer en mettant en œuvre le processus d'ÉE national. Le tri préliminaire consiste également à déterminer la catégorie du projet et ainsi, les études environnementales et sociales requises en vertu de ce CÉE.

À la phase de préparation du projet, l'objectif du cadrage environnemental est de préparer les termes de référence (TDR) des études environnementales et sociales identifiées durant le tri environnemental, conformément à la législation nationale et aux politiques applicables nationales et du bailleur de fonds, telles que les politiques de sauvegarde de la Banque mondiale. L'agence environnementale nationale du pays d'origine du projet approuve les TDR préparés par le promoteur.

**Figure 2 Organisation du processus régional d'évaluation environnementale**

	Promoteur	Agence environnementale nationale	Groupe de travail régional pour l'ÉE	Bailleur de fonds	Comité technique d'analyse	Nile Technical Advisory Committee (Nile TAC)
Étape 1 Tri préliminaire	Préparation de l'avis de projet	Tri préliminaire du projet en fonction des critères nationaux et régionaux				
↓			Détermination de la catégorie du projet Identification des documents à préparer	Non-objection		
↓	Consultation des groupes affectés et des ONG locales Préparation des TDR des études requises	Consultation des groupes affectés et des ONG locales Approbation des TDR				
↓	Préparation des études Consultations publiques	Analyse de conformité				
↓	Analyse externe Achèvement des études	Analyse externe		Analyse interne des études	Analyse interne des études	
↓	Appel en cas de décision contestée	Recommandation de décision Attribution du permis environnemental	Revue du processus et décision	Non-objection		Appel en cas de décision contestée
↓	Documentation de la mise en œuvre du PGES	Contrôle de la mise en œuvre du PGES		Supervision		
↓	Préparation de l'audit environnemental et social	Analyse de l'audit				

L'étape de l'évaluation des impacts comprend trois principales activités: 1) préparation des études; 2) consultations publiques; 3) analyse de la conformité. Les projets de Catégorie A demandent une étude d'impact environnemental (EIE) complète, un plan de gestion environnementale et sociale (PGES) et une analyse du cycle de vie (ACV). Les projets de Catégorie B peuvent demander une EIE limitée ou seulement un PGES. La plupart des enjeux sociaux déclenchés par les projets de production électrique seront intégrés dans les TDR de l'EIE. De plus, il est probable qu'un plan de réinstallation (PR) soit requis pour la plupart des projets assujettis au processus régional. Dans certains cas, les enjeux liés aux populations autochtones peuvent également demander des études spéciales.

À la phase d'analyse et d'approbation du projet, le processus d'ÉE comprend l'analyse des études (étape 5) et la prise de décision (étape 6). L'analyse des études comporte: 1) l'analyse interne des études et l'approbation nationale d'un projet Mécanisme de Développement Propre (MDP); 2) l'analyse externe par la diffusion des études et la consultation publique; 3) l'achèvement des études par le promoteur du projet. Cette décision peut soit autoriser le projet, avec ou sans conditions, ou soit refuser le projet, le tout suivi de la non objection du bailleur de fonds et l'attribution du permis environnemental. Il est aussi important de s'assurer que les recommandations des études environnementales et sociales soient intégrées dans les documents d'appel d'offre et contractuels.

À la phase de mise en œuvre du PGES, l'étape 7 du processus d'ÉE consiste à s'assurer durant la durée du projet de production électrique que les mesures identifiées pour prévoir, atténuer, ou compenser les impacts négatifs environnementaux et sociaux sont bel et bien mises en œuvre. Enfin, en phase d'évaluation, la dernière étape du processus d'évaluation environnementale comprend: 1) l'audit environnemental et social; 2) L'analyse de l'audit. L'audit environnemental est une analyse objective qui consiste à déterminer si les activités du projet sont en conformité ou pas avec les normes.

Afin de faciliter l'identification et l'atténuation des impacts environnementaux et sociaux des projets régionaux de production électrique, des lignes directrices générales d'évaluation environnementale et sociale ont été développées dans le cadre de ce CÉE.

En ce qui concerne les projets hydroélectriques, la construction et l'opération de barrages et réservoirs comprennent plusieurs activités qui peuvent causer des impacts potentiels environnementaux et sociaux importants. Les principaux concernent les modifications au régime hydrologique, la pêche, la faune, les travailleurs non-résidents, l'agriculture et la



réinstallation involontaire. Ces projets peuvent entraîner d'importantes acquisitions de terres et réinstallations involontaires de personnes. C'est pourquoi la conception de ces projets doit être basée sur d'importantes études d'alternatives.

Par ailleurs, les impacts environnementaux de l'opération d'une centrale d'énergie thermique sont liés à la qualité de l'air, de l'eau et du sol, ainsi qu'à la gestion des déchets solides. Les impacts sur la végétation, la faune, les populations locales et la santé des travailleurs doivent aussi être considérés. D'autre part, l'énergie géothermique offre du point de vue environnemental un certain nombre d'avantages par rapport aux combustibles fossiles utilisés dans les centrales thermiques. En effet, l'énergie géothermique est propre et sécuritaire pour l'environnement. De plus, l'énergie géothermique est compétitive du point de vue économique et permet de réduire la dépendance aux combustibles fossiles coûteux.

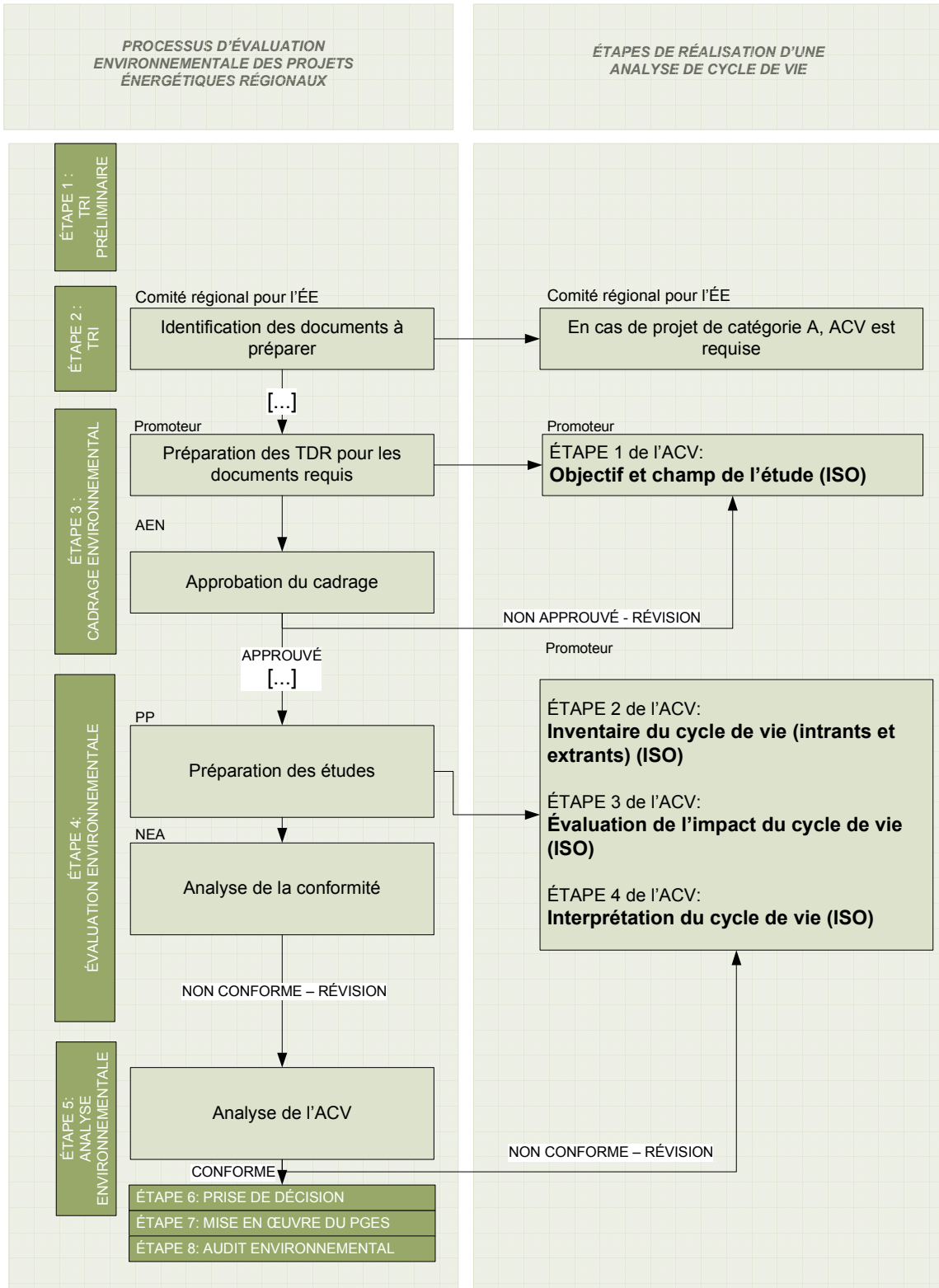
Les lignes de transmission et de distribution d'électricité peuvent permettre à des activités humaines telles que la colonisation, l'agriculture et la chasse d'accéder à des territoires jadis isolés. Le déboisement de l'emprise peut résulter dans la perte et la fragmentation d'habitats et de végétation le long de la ligne. Ces effets peuvent être significatifs si des zones naturelles telles que des milieux humides et des forêts sont touchées, ou si les terres nouvellement accessibles sont habitées par des peuples autochtones.

Afin de mieux orienter la préparation des études environnementales de projets régionaux de production électrique, il sera important que des lignes directrices détaillées d'ÉIE soient prochainement développées afin d'harmoniser les contenus des études futures.

### **Analyse du cycle de vie**

Ce CÉE intègre l'analyse du cycle de vie (ACV) dans l'évaluation environnementale des projets régionaux de production électrique. Cette approche est très innovatrice mais aussi très intéressante considérant que, sur une échelle spatiale, elle englobe le projet du « berceau à la tombe », ce qui rend l'ACV complémentaire à l'évaluation des impacts environnementaux (ÉIE) du projet. L'ACV comprend 4 étapes: 1) objectif et champ de l'étude, 2) inventaire du cycle de vie (intrants et extrants), 3) exigences de l'évaluation des impacts, et 4) interprétation de l'évaluation des impacts. La figure 3 montre la relation entre l'ACV et le processus d'ÉE des projets régionaux de production électrique.

**Figure 3 Analyse du cycle de vie dans le processus d'ÉE**



## **Mécanisme de développement propre**

Le Mécanisme de Développement Propre (MDP), développé sous l'égide du Protocole de Kyoto, est d'un grand intérêt pour les pays en voie de développement car il permet d'y canaliser les investissements étrangers pour promouvoir le développement durable et la réduction des gaz à effet de serre tout en générant des crédits réduction des émissions de gaz à effet de serre (GES). Pour être éligible aux fonds du MDP, un projet doit mener à des réductions réelles et mesurables de GES et contribuer au développement durable du pays hôte. En outre, plus d'un pays peut accueillir un projet admissible. Dans la plupart des cas, la vente de crédits d'émissions de carbone dans le cadre du MDP permettra de financer une partie du projet, qui devra être généralement complétée par un financement conventionnel.

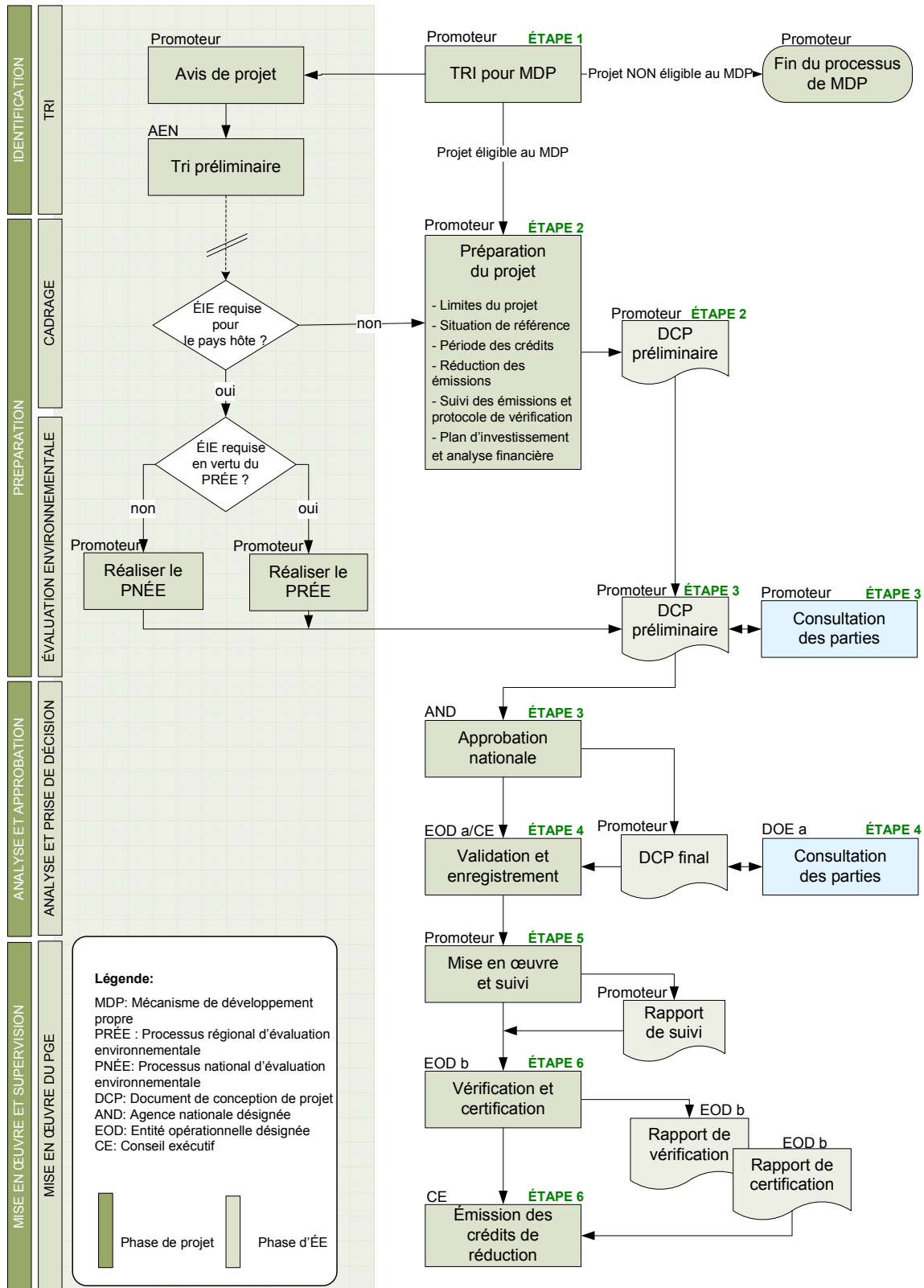
La figure 4 présente une vue d'ensemble de l'intégration du MDP dans le processus d'ÉE des projets régionaux d'électricité. Durant tout le processus, le promoteur du projet aura à préparer un document de conception du projet (DCP) qui sera par la suite évalué par une Autorité Nationale Désignée et le Conseil Exécutif (CE) du MDP. Deux Entités Opérationnelles Désignées auront aussi à donner un avis au Conseil Exécutif sur le contenu du DCP et à assurer le suivi des réductions des émissions de GES avant que soient accordés les crédits d'émissions de carbone.

Un des éléments cruciaux du DCP est de définir le scénario de base, qui est la mesure des émissions en l'absence du projet proposé et qui est utilisé pour estimer les réductions d'émissions grâce au projet. Le tableau 3 identifie les scénarios de base potentiels dans les pays du NBI et par conséquent, les projets éligibles sur la base des plans stratégiques énergétiques.

## **Mise en vigueur du cadre d'évaluation environnementale**

La figure 5 présente le processus de mise en vigueur du CÉE pour les projets régionaux de production d'électricité. Le Protocole proposé devra être ratifié par chaque pays du NBI, par une réglementation entérinée par les Ministres chargé de l'Environnement.

**Figure 4 Mécanisme de développement propre dans le processus d'évaluation environnementale**

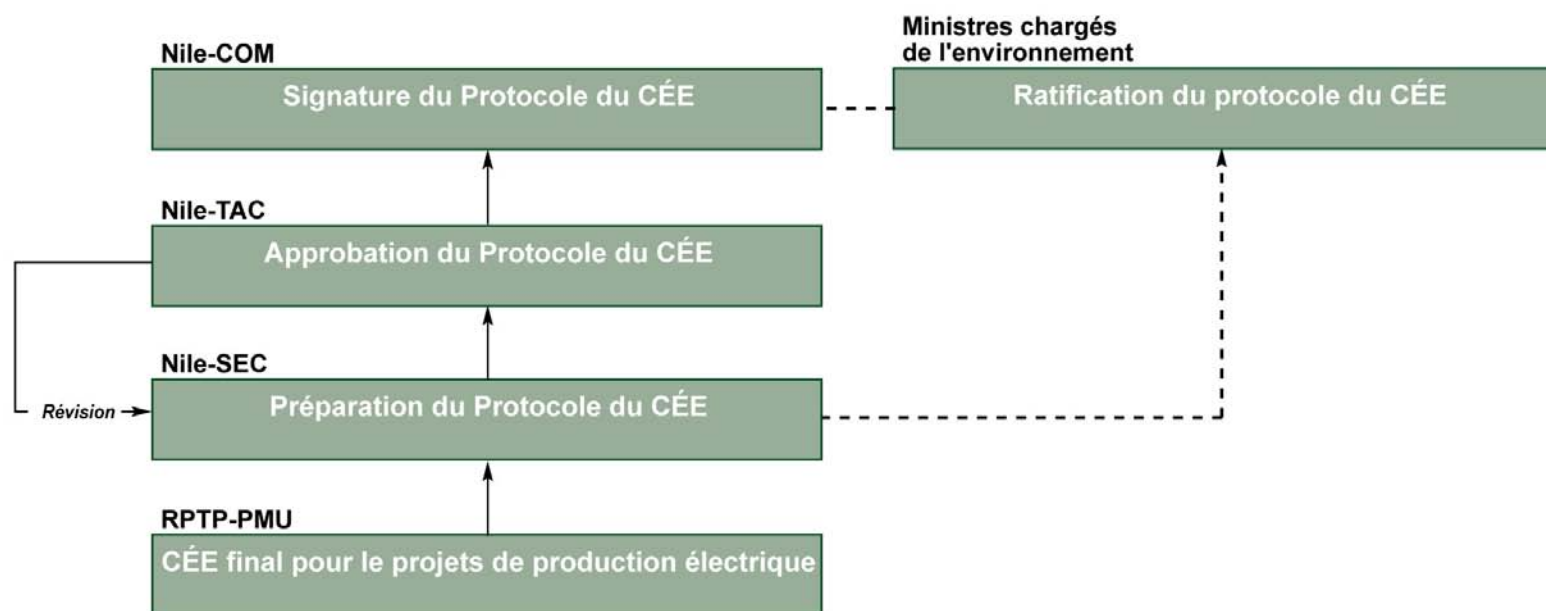


**Tableau 3 Scénarios de base potentiels et projets éligibles basés sur les plans stratégiques énergétiques**

Pays	Scénarios de base	Projets potentiels de production électrique
Burundi	Hydroélectricité	Énergies renouvelables (éolien, solaire, biomasse...)
République Démocratique du Congo	Méthane	Énergies renouvelables (éolien, solaire, biomasse...) Hydroélectricité Géothermique
Kenya	Charbon	Énergies renouvelables (éolien, solaire, biomasse...) Hydroélectricité Géothermique Gaz naturel
Rwanda	Méthane	Énergies renouvelables (éolien, solaire, biomasse...) Hydroélectricité Géothermique
Tanzanie	Gaz naturel	Énergies renouvelables (éolien, solaire, biomasse...) Hydroélectricité Géothermique
Ouganda	Hydroélectricité	Énergies renouvelables (éolien, solaire, biomasse...)
Égypte	Gaz naturel	Énergies renouvelables (éolien, solaire, biomasse...) Hydroélectricité Géothermique
Éthiopie	Charbon	Énergies renouvelables (éolien, solaire, biomasse...) Hydroélectricité Géothermique Gaz naturel
Soudan	Fuel	Énergies renouvelables (éolien, solaire, biomasse...) Hydroélectricité Géothermique Gaz naturel

Afin d'assurer la mise en œuvre du CÉE, il est essentiel que le personnel concerné des organisations institutionnelles impliquées dans le processus soit formé et familiarisé avec les composantes du CÉE. Celui-ci propose d'ailleurs un programme préliminaire de renforcement des capacités qui devra être validé par une analyse institutionnelle des agences environnementales des pays du NBI.

Le budget préliminaire requis pour rendre opérationnel ce CÉE pour les projets régionaux de production électrique est estimé à 1,62 million \$US durant les dix années suivant son acceptation par les autorités du NBI (tableau 4). Ce budget est basé sur l'hypothèse que 30 projets régionaux seront évalués dans les dix prochaines années par les pays du NBI.

**Figure 5** Mise en vigueur du CÉE pour les projets régionaux de production d'électricité

**Tableau 4 Budget préliminaire de mise en œuvre du cadre d'évaluation environnementale  
 (en \$ US courants)**

Activités	Années										Total	
	1	2	3	4	5	6	7	8	9	10		
<b>Assistance technique</b>												
Développement du Protocole d'ÉE	75 000											75 000
Lignes directrices d'ÉE détaillées	95 000	97 850	100 786									293 636
<b>Renforcement des capacités</b>												
Analyse institutionnelle	95 000											95 000
Ateliers (3)		70 000										70 000
Assistance technique pour l'analyse des EIE		25 000										25 000
Revue annuelle		30 000	30 900	31 827	32 782	33 765	34 778	35 822	36 896	38 003		304 773
<b>Mise en œuvre du processus d'ÉE</b>												
Groupe de travail régional pour l'ÉE (temps partiel)		25 000	25 750	26 523	27 318	28 138	28 982	29 851	30 747	31 669		253 978
Agences environnementales nationales (temps partiel)		50 000	51 500	53 045	54 636	56 275	57 964	59 703	61 494	63 339		507 955
<b>Total</b>	<b>265 000</b>	<b>297 850</b>	<b>208 936</b>	<b>111 395</b>	<b>114 736</b>	<b>118 178</b>	<b>121 724</b>	<b>125 375</b>	<b>129 137</b>	<b>133 011</b>		<b>1 625 342</b>





# MODULE 2

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Chapters 1 to 5



## **1 INTRODUCTION**

### **1.1 Background**

The Nile River, the longest river of the world, flows on more than 6,800 km from its source at the head of the Kagera Basin in Rwanda and Burundi to its delta in Egypt on the Mediterranean Sea. The river is shared by 10 countries: Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Eritrea, Kenya, Rwanda, Sudan, Tanzania, and Uganda. Five of these are among the poorest in the world. The basin covers 3.1 million km<sup>2</sup>, representing 10% of the land of Africa.

The Nile River has played a key role in human settlement and the development of diversified cultures and livelihoods for thousand of years. It encompasses famous environmental assets, such as Lake Victoria, the second largest freshwater body in the world, and the vast wetlands of the Sudd in Sudan. The population living in the basin is estimated at about 160 million people, and more than 300 million people live in the 10 countries that share the Nile waters. This number is expected to double in the next 25 years. All of these people rely to a greater or lesser extent on the waters of the Nile for their basic needs and economic growth.

Recognizing that cooperative development holds the greatest prospects for bringing benefits to the entire region, and aware of the challenges, the Nile riparian countries (Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda) established in February 1999 the Nile Basin Initiative (NBI) to address their common concerns and interests, particularly poverty alleviation. The NBI provides an institutional mechanism, a shared vision, and a set of agreed policy guidelines to provide a basinwide framework for cooperative action.

The Vision of the NBI is to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the Nile basin water resources. The policy guidelines define the following as the primary objectives of the NBI:

- To develop the Nile basin water resources in a sustainable and equitable way to ensure prosperity, security, and peace for all its peoples;
- To ensure efficient water management and the optimal use of the resources;
- To ensure cooperation and joint action between the riparian countries, seeking win-win gains;

- To target poverty eradication and promote economic integration; and
- To ensure that the program results in a move from planning to action.

To translate this Vision into action, the NBI includes a vast program with two main components:

- The basin-wide Shared Vision Program, to lay the groundwork for cooperative action through a regional program to build confidence and capacity throughout the basin.
- The Subsidiary Action Programs, to pursue cooperative development opportunities to realize physical investments and tangible results through sub-basin activities in the Eastern Nile and the Nile Equatorial Lakes regions.

The Regional Power Trade Project (RPTP) is one of the components of the Shared Vision Program. The RPT is a project to be implemented basin-wide to help establish a foundation for transboundary regional cooperation and to create an enabling environment suitable for investments and action on ground within an agreed basin-wide framework. The RPT aims to establish the institutional means to coordinate the development of regional power trade and markets among the NBI countries.

## **1.2 Objective, purpose and scope of the EA framework for regional power projects**

The objective of this environmental assessment (EA) framework is to ensure that the development of regional power trade and markets among the NBI countries be implemented according to sustainable development principles, including the integration of environmental and social considerations through sound EA best practices.

The purpose of this EA framework is to guide the environmental agencies of the NBI countries, project proponents and EIA practitioners to implement the proposed harmonised EA process for all regional power projects defined as such in this document. It is hoped that this in turn will facilitate greater consideration and integration of environmental concerns in regional power projects.

Finally, the scope of this EA framework focuses on hydropower, thermal and geothermal and transmission lines projects qualifying to the proposed harmonised regional EA process. As agreed upon between the environmental agencies of the NBI countries, such types of projects are subjected to the proposed EA process if the project affects or provides benefits to at least two NBI countries, if the project is likely to cause significant adverse

transboundary impacts or if the project is likely to cause significant adverse impacts on an international heritage site.

### **1.3 Contents of the EA framework**

This EA framework comprises 11 chapters and various appendices:

- Following this introduction, Chapter 2 presents background information on the Nile River basin, Nile Basin Initiative (NBI) countries and NBI programs;
- Chapter 3 highlights the main features of the power sector in the NBI countries;
- Chapter 4 describes the environmental and social framework and procedures in the NBI countries;
- Chapter 5 summarises the review of how the environmental and social issues related to power projects are considered by the main international funding agencies;
- Chapter 6 discusses the inter-linkages between environmental sustainability, poverty reduction strategies and socio-economic development activities within the context of regional power investment projects;
- Chapter 7 describes in details the whole EA process for regional power projects;
- Chapter 8 presents issues to consider in the preparation of environmental and social impact assessment for regional power projects;
- Chapter 9 describes the proposed approach to integrate life cycle assessment in the EA process;
- Chapter 10 explains in details how the NBI countries could access to the Clean Development Mechanism through regional power projects;
- Chapter 11 proposes a mechanism to enforce the EA framework in the NBI countries as well as institutional capacity building to ensure its implementation;
- Finally, the appendices comprise the lists of documents and stakeholders consulted to conduct this study, and various supporting documents to implement this EA framework.

This final draft report takes into account the comments received from the environmental agencies of the NBI countries during the mid-term workshop held in Dar es Salaam on October 1<sup>st</sup> and 2<sup>nd</sup>, 2007, as well as the comments of these agencies and PTC members during the draft report workshop meeting held on December 14<sup>th</sup> and 15<sup>th</sup> 2007 at Entebbe in Uganda.



## 2 NILE RIVER BASIN AND NILE BASIN INITIATIVE

This section presents background information on the Nile River basin, Nile Basin Initiative (NBI) countries and NBI programs.

### 2.1 General description of the Nile basin

The Nile Basin covers an area of nearly 3.1 million km<sup>2</sup> representing about 10% of the African continent (Figure 2.1). Table 2.1 shows the distribution of the basin within the 10 riparians countries. The two downstream countries of the basin, Sudan and Egypt, encompass 63% and 10% of the Nile river basin respectively. At the opposite, upstream countries such as Burundi, DRC and Rwanda occupy each less than 1% of the basin.

**Table 2.1 Area of the Nile River basin by country**

Country	Total area (km <sup>2</sup> )	Basin area in country (km <sup>2</sup> )	% of the country	% of the basin
Burundi	27 834	14 318	51.4	0.5
DRC	2 345 000	28 180	1.2	0.9
Egypt	995 450	304 246	30.6	9.8
Eritrea	121 320	24 699	20.4	0.8
Ethiopia	1 127 127	349 625	31.0	11.3
Kenya	582 650	44 599	7.7	1.4
Rwanda	26 338	20 917	79.4	0.7
Sudan	2 505 810	1 947 683	77.7	63.0
Tanzania	945 087	115 219	12.2	3.7
Uganda	250 066	241 359	96.5	7.8
<b>Total</b>	<b>8 926 682</b>	<b>3 090 844</b>	<b>34.6</b>	<b>100.00</b>

Source: Tecsalt, 2007

The Nile River is the longest river in the world (6,825 km), but it is relatively not a big river in terms of volume of water. The contrast between the size of the basin and the comparatively small volume of runoff is an important feature and among the main causes of the rising water scarcity concerns.

### The White Nile

The Ruvyironza, considered as the ultimate source of the Nile, is one of the upper branches of the Kagera River. The Kagera follows northward the boundary of Rwanda, turns where the borders of Rwanda, Uganda and Tanzania meet, and drains into Lake Victoria. On leaving Lake Victoria at the site of the now-submerged Owen Falls, the Nile rushes for 483 km over rapids and cataracts, at first northwest and then west, until it enters Lake Albert.

The section between the two lakes is called the Victoria Nile. The river leaves the northern end of Lake Albert as the Albert Nile, flows through northern Uganda, and at the Sudan border becomes the Bahr al Jabal. At its junction with the Bahr al Ghazal, the river becomes the Bahr al Abyad, or the White Nile. At Khartoum the White Nile is joined by the Blue Nile, or Bahr al Azraq. These are so named because of the colour of the water.

### **The Blue Nile**

The Blue Nile is 1529 km long. Its source is Lake Tana in the Ethiopian highlands. The Blue Nile rises at a spring site upstream of Lake Tana in Ethiopia, at 2,150 m above sea level. The river flows west then north until it eventually meets the White Nile at Khartoum. A length of 800 km is navigable during high water times. Some 80% of Sudan's electricity is provided by hydroelectric schemes at Roseires and Sennar, and these dams provide irrigation water for over 10,000 km<sup>2</sup> of the Gezira Plain.

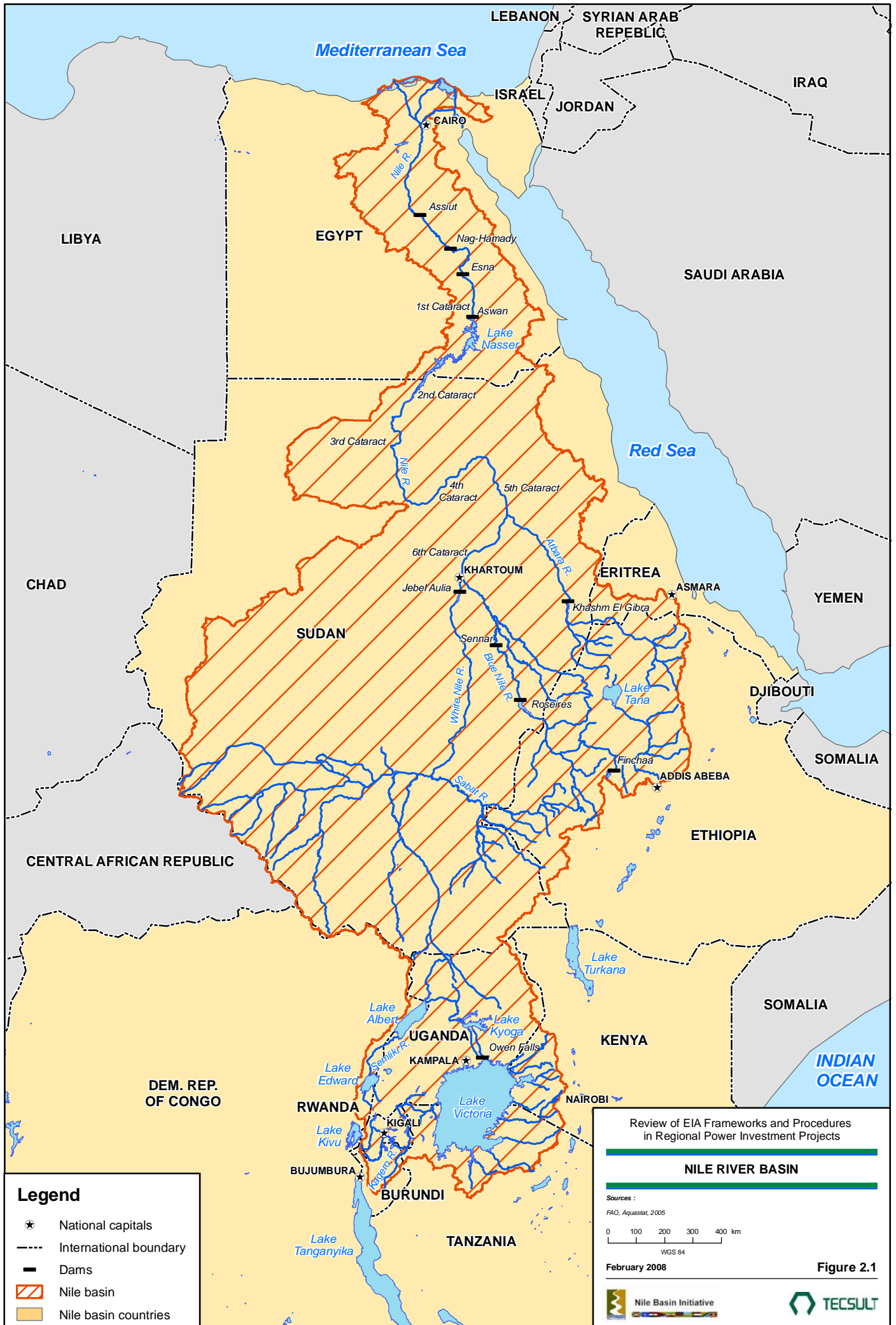
*Nile River in Ethiopia*



### **The Main Nile**

From Khartoum, the Nile flows northeast on 322 km below Khartoum where it is joined by Atbarah River. The black sediment brought down by the Atbarah and Blue Nile rivers settle in the Nile delta making it very fertile. This process historically occurred during the annual flooding of the Nile in the summer months. However, the opening of the Aswan High Dam in the early 1970s allowed for control of the flooding and reduced sediment deposits in the river as these now settle in Lake Nasser. During its course from the confluence of the Atbarah through the Nubian Desert, the river makes two deep bends. From Khartoum to Aswan there are six cataracts. The Nile is navigable to the second cataract on a distance of 1,545 km. The delta of the Nile is 190 km wide. The water level behind the Aswan Dam fell from 170 m in 1979 to 150 m (492 ft) in 1988, threatening Egypt's hydroelectric power generation.





**Legend**

- ★ National capitals
- - - International boundary
- Dams
- ▨ Nile basin
- Nile basin countries

Review of EIA Frameworks and Procedures  
in Regional Power Investment Projects

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**NILE RIVER BASIN**

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Sources :  
FAO, Aqustat, 2005

0 100 200 300 400 km  
WGS 84

February 2008

**Figure 2.1**

Nile Basin Initiative

TECSULT



The Nile plays a vital role in the socio-economic development of the Nile riparian states. Agriculture is the dominant economic sector in most of these countries, and reliable access to water remains an issue to increasing agricultural productivity, providing employment, and to raising the standards of living of the people residing in the basin. The Nile also represents a vast resource for hydropower generation.

*Ashwan dam in Egypt*



The Nile region is characterised by environmental degradation, conflicts, drought, and poverty. However, the Nile waters represent a tremendous potential for social and economic development. Collaborative and sustainable development of the shared water resources can attract investment and contribute to alleviate poverty.

## **2.2 NBI countries**

The countries forming the Nile Basin Initiative can be subdivided in two groups, i.e. Eastern Nile countries including Egypt, Sudan and Ethiopia, and Nile Equatorial Lakes countries, namely Burundi, Democratic Republic of Congo (DRC), Kenya, Rwanda, Tanzania and Uganda.

### 2.2.1 Eastern Nile countries

Egypt, located downstream of Nile river, encompasses 10% of the river basin. Except along the Mediterranean coast and the Sinai, there is nearly no rainfall over most of the country. Thus, the Nile constitutes the main source of renewable freshwater of Egypt. Most of the population lives within the basin, within a narrow strip along the Nile and in the delta area where the density of the population is important. Environmental issues in Egypt include the preservation of aquatic habitats and biodiversity for fisheries production, protection of water quality in order to reduce impacts on human health, as well as soil erosion, desertification, aquatic weeds, and sea water intrusion in the Nile delta.

Ethiopia includes 11% of the Nile basin. Located in the eastern portion of the Nile basin, the Ethiopian highlands give rise to some of the major tributaries of the Nile, i.e. the Abbay (Blue) Nile, the Tekeze (Atbara) River, and the Baro-Akobo (Sobat) River, contributing to more than 75% of the average annual flow of the Main Nile. Rainfall in the Nile Basin portion of the country is relatively high, but seasonal and confined to a four month period. During the rains, the rivers are flashy and transport high loads of sediments. In addition, deforestation and soil erosion have become very significant environmental problems.

*Women in Ethiopia*



Sudan, the largest country of Africa, lies at the center of the Nile basin, encompassing 63% of the total basin area. About 85% of the population of Sudan live within the Nile basin, but the density is relatively low. The major tributaries of the Nile meet within Sudan. As mentioned above, the White and Blue Nile join at Khartoum to form the Main Nile. The

northern part of the country receives very low rainfall and is therefore desert or semi-desert. The vast wetland areas in the south receive relatively high rainfall, but evaporation is important. Environmental issues in Sudan include water management for irrigation schemes, sedimentation and floating trash problems, as well as soil degradation and desertification.

### 2.2.2 Nile Equatorial Lakes countries

Burundi is a small country located in the southwest of the region. Hosting the most southern source of the Nile, Burundi encompasses 0.5% of its basin. About half (51%) of Burundi's land area drains into the Nile basin, whereas the other half drains into Congo River. The country is mountainous with high rainfall. However, the abundant water resources are used by a high density of population. Environmental issues include progressive decline of the water quality due to demographic pressure, deforestation and soil erosion, and high sediment loads which affect hydropower generation.

DRC is a very large country in the southwest of the Nile basin, but includes only 0.9% of it. Rainfall over most of the country is important and the abundant water resources drain into Congo River basin. Only 1.2% of DRC's land area drains into the Nile, but the population density in this area is approximately five times higher than in the rest of the country. The Nile waters from DRC flow into lakes Edward and Albert, which lie on the border between DRC and Uganda. Environmental issues include high suspended solids loads in rivers and several degraded wetlands. Water hyacinth problems are important in Kasai and Congo rivers, but are not yet very significant in the Nile basin part of the country.

Kenya is located on the shore of Lake Victoria in the southeast part of the Nile basin, and includes 1.4% of it. The portion of the country within the Nile basin is relatively small, constituting about 10% of the country. However, the population density in this area is high and represents about 40% of the country's population. Environmental issues in Kenya include farming activities extended to steep hill slopes resulting in soil erosion and sedimentation problems. Other environmental issues include the maintenance of water quality, conservation of wetlands, and control of aquatic weeds in Lake Victoria.

Rwanda is a small country located in the southwest of the Nile basin. It encompasses 0.7% of the basin and about 80% of the country is located within the Nile Basin, while the remaining portion drains into the Congo River basin. The country is mountainous with relatively high rainfall. Rwanda is the country with the highest population density in the Nile basin. The Kagera River which drains from Rwanda, as well as from Burundi, Tanzania and Uganda, is the largest tributary to Lake Victoria. Environmental problems in Rwanda include localized high sediment loads and toxic materials from mining, pollution from untreated domestic sources, detrimental effect of aquatic weeds, as well as soil erosion and desertification in the semi-arid areas.

Tanzania is one the largest country of the region located on the shore of Lake Victoria at the southern end of the basin and includes 3.7% of it. In general, the country is relatively rich in water resources, but water availability varies throughout the country. The Nile basin portion, which represents 12% of Tanzania, is relatively humid, with above average population density. Environmental problems in Tanzania include among others water pollution aggravated by increasing population and economic activities, extensive clearing of forests and bush fires resulting in soil erosion and high turbidity in surface waters.

*Katonga river in Uganda*

Uganda is located in the southern part of Nile basin and encompasses 7.6% of it. Most of the country (96%) lies within the Nile basin. In Uganda, Lake Victoria discharges into the Victoria Nile. Most of the country has relatively



high rainfall. Surface water resources, therefore are relatively abundant, but the variability is high too. Uganda serves as an important bridge country as it is downstream of DRC, Rwanda, Burundi, Tanzania and Kenya and upstream of Sudan and Egypt. Important environmental issues include land use changes which are having an increasing impact on the quantity and quality of water and degradation of wetlands, the deterioration in water quality and ecology of Lake Victoria and the Victoria Nile, proliferation of water hyacinth, and pollution by toxic metals and other hazardous chemicals from mines. The increasing

encroachment in forested areas resulting in the loss of forest biomass and the drainage and conversion of wetlands and forest biomass are a large concern in Uganda.

### **2.3 NBI strategic action program**

The Nile Basin Initiative (NBI) is a partnership of the riparian states of the Nile. The NBI seeks to develop the river in a cooperative manner, share substantial socioeconomic benefits, and promote regional peace and security. The NBI began with a participatory process of dialogue among the riparians that resulted in the agreement on a shared vision: to “achieve substantial socioeconomic development through the equitable utilization of, and benefit from, the common Nile basin water resources,” and a Strategic Action Program to translate this vision into concrete activities and projects<sup>1</sup>.

The NBI’s Strategic Action Program comprises two complementary programs: the basin-wide Shared Vision Program (SVP) to build confidence and capacity across the basin, and Subsidiary Action Programs (SAP) to initiate concrete investments and action on the ground at sub-basin levels. The SVP, which focuses on building regional institutions, capacity and trust, lays the foundation for unlocking the development potential of the Nile, which can be realized through the SAP. These investment-oriented programs are currently under preparation in the Eastern Nile and the Nile Equatorial Lakes Regions (ENSAP and NELSAP).

The SVP includes seven thematic projects related to environment, power trade, agriculture, water resources planning and management, applied training, communications and stakeholder involvement, and macro-economics. An eighth project, the SVP Coordination Project, aims at building capacity at the NBI Secretariat for program execution and coordination. The SVP is being executed by the Secretariat of the Nile Basin (Nile-SEC) on behalf of the Nile Council of Ministers (Nile-COM). In executing the program, the NBI is supported by a Technical Advisory Committee (Nile-TAC) drawn from participating member countries.

The Regional Power Trade Project (RPTP) is one of eight projects being implemented under the SVP. The project aims to facilitate the development of regional power markets among

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<sup>1</sup>. Nile Council of Ministers, Policy Guidelines for the Nile River Basin Strategic Action Program, February 1999.

the ten Nile Basin countries and build analytical capacity and provide technical infrastructure to manage the Nile basin resources in keeping with the Vision.

Cheap and reliable supply of electricity is a critical input for economic growth, employment generation and poverty alleviation. As such, the long term objective of the RPTP is to contribute to poverty reduction in the Region by assisting the NBI countries in developing the tools for improving access to reliable and low cost power in the Nile basin in an environmentally sustainable manner. An important element in achieving this goal is to create an effective institutional mechanism to promote and develop power trade opportunities among the countries participating in the Nile Basin Initiative. Facilitating the development of a regional electricity market can play a key role in furthering co-operation among the Nile basin states and in ensuring that the resources of the Nile Basin are developed and managed in an integrated and environmentally sustainable manner.



### **3 POWER SECTOR IN THE NBI COUNTRIES**

This section presents the main features of the power sector in the NBI countries, which are subdivided into the Eastern Nile and Nile Equatorial Lakes (NEL) countries. The current and potential situations in the Eastern Nile countries are discussed on the basis of the Eastern Nile Power Trade Program Study (EDF, March 2007), whereas the situation of the NEL countries is based on the findings of the Strategic/Sectoral, Social and Environmental Assessment of Power Development Options in the NEL Region (SNC Lavalin International, February 2007).

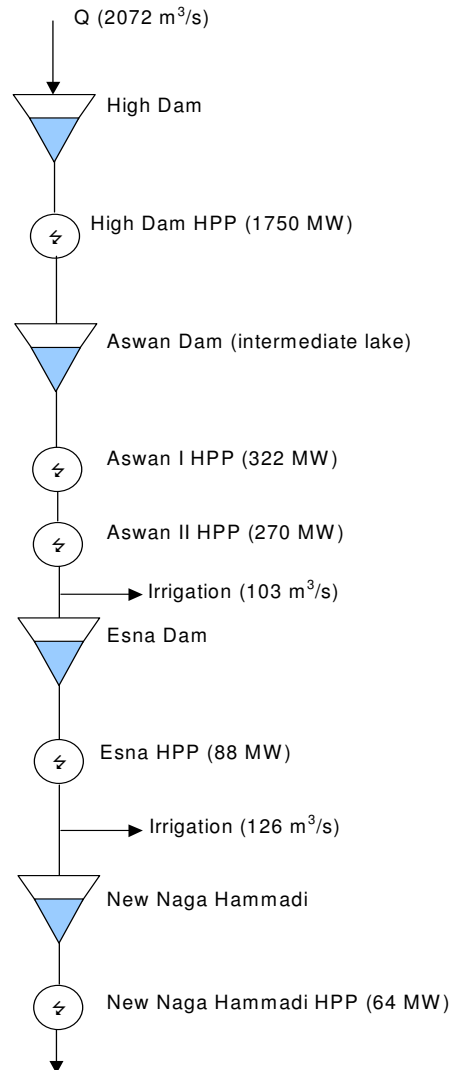
#### **3.1 Eastern Nile**

##### **3.1.1 Egypt**

Egypt has a population of about 70 million inhabitants (2005). Its electric utility comprises nine regional electricity distribution companies, five regional electricity generation companies and one electricity transmission companies. All these companies are blended in the Egyptian Electricity Holding Company (EEHC), under the Ministry of Electricity & Energy.

According to the 2005-2006 annual report of the Egyptian Electricity Holding Co (EEHC), Egypt's installed generating capacity stood at 20.45 gigawatts (GW), with plans to add 8.38 GW of additional generating capacity by mid-2012. Around 85% of Egypt's electric generating capacity is powered by natural gas, with the remaining 14% hydroelectric, mostly from the Aswan High Dam. Wind-farm account for 1%. All oil-fired plants have been converted to run on natural gas as their primary fuel, and thermal power plants now account for roughly 65% of Egypt's total gas consumption.

Hydro plants in Egypt are distributed along the Nile (Figure 3.1), with High Dam upstream using Nasser lake reservoir water, followed by Aswan I and Aswan II, both with a small intermediate reservoir. Then, downstream, two run of the river power stations complete the whole hydro system: Esna and Naga Hammadi (with a small power station that will be replaced by a new one committed to 2007/2008).

**Figure 3.1 Hydro scheme for the existing hydropower plants in Egypt**

Source: Eastern Nile Power Trade Program Study (EDF, March 2007)

In Egypt, peak demand increased from 5,400 MW (1985/1986) to 17,300 MW (2005/2006). In the same period, energy generated increased from 32 TWh to 108 TWh, with a growth rate of 7% in the last ten years (EDF, 2007).

Egypt is interconnected with Libya and Jordan, for emergency situations and for power trade between Egypt and Jordan. Exports and imports measured from 2003 to 2005 represented less than 1% of total Egyptian electrical generation, but 20% of Jordanian generation. An export balance of 20 GWh to Libya and of 680 GWh to Jordan were measured in 2004/2005.

The existing transmission system is equipped with a double circuit 500 kV backbone along the Nile river, from Aswan Dam (2,100 MW) to Cairo, and a single circuit (500 kV) from Cairo to the interconnection with Jordan. A 132 kV and 220 kV circuit follows the 500 kV

backbone along the Nile river. The delta zone is supplied with a meshed 220 kV network, and extends towards west to Libya with a double circuit interconnection.

### 3.1.2 Sudan

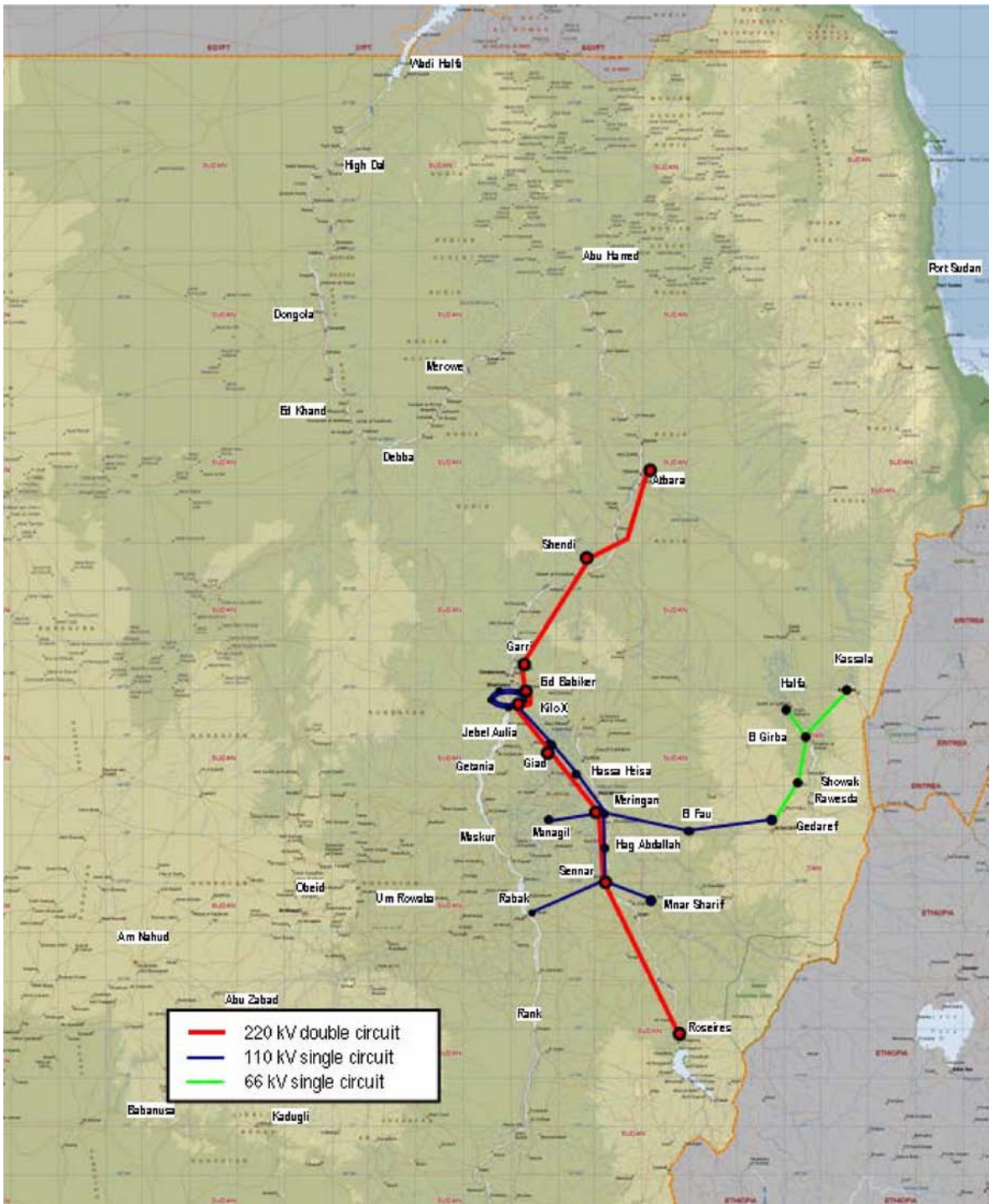
Sudan has a population of 35 millions inhabitants (2005). Its electrification ratio is one of the lowest in the world, estimated at about 19% of households with electricity supply (EDS, 2007).

The power installed capacity in Sudan is about 840 MW, the majority of electricity being generated by conventional thermal sources (59%), with the remainder coming from hydroelectricity (41%) (EDS, 2007). The country's main hydroelectricity generating facility is the 280-MW Roseires dam located on the Blue Nile river basin, approximately 550 km southeast of Khartoum.

According to NEC master plan, 55% of the power plants identified as committed contributors to the Sudan generation expansion plan are thermal (mainly steam plant) whereas 45% are hydropower plants.

The National Electricity Corporation (NEC) is responsible for electricity generation, transmission and distribution in Sudan. NEC transmits electricity through two interconnected electrical grids, the Blue Nile Grid and the Western grid, which cover only a small portion of the country. Regions not covered by the grid often rely on small diesel-fired generators for power (figure 3.2).

**Figure 3.2 Map of Sudanese Grid**



Source: Eastern Nile Power Trade Program Study (EDF, March 2007)

### 3.1.3 Ethiopia

Ethiopia has a population of about 75 million inhabitants (2005). Its energy consumption per capita of 28 kWh is also one of the lowest in the world. Access to electricity is estimated at 17% of the households.

*Power substation in Ethiopia*

According to the Eastern Nile Power Trade Program Study, the Interconnected System of Ethiopia has a total installed capacity of 766.9 MW (end of 2006) including 96.3 MW of diesel plants at Dire Dawa, Awash, and Kaliti, and a geothermal plant at Aluto-Langano (7.3 MW). The vast majority of



Ethiopia's existing capacity (87%) is hydroelectric. The EEPSCO, the state-owned organisation responsible for electricity generation, plans to construct several new generating facilities to provide electricity to Ethiopia. Currently, less than half of Ethiopia's towns have access to electricity, though EEPSCO electrified more than eighty towns between 2001 and 2003. Since most of Ethiopia's electricity is generated from hydroelectric dams, the country's power system is vulnerable to extended droughts. Ethiopia recently endured more than six months of power cuts due to low water levels in dams around the country.

EEPCO is rapidly expanding its generating capacity. The 73-MW Tis Abay 2 facility, located on the Blue Nile (Abay) was commissioned in 2001. The 192-MW Gilgel Gibe hydroelectric facility began its operations in 2004. EEPSCO has begun the construction of new hydroelectric generating facilities at Tekeze (300 MW) and Gilgel Gibe II (420 MW) that are expected to be in operation in 2008 (see figure 3.3).

In addition, Beles and Yayu coal plants are sought to be on line by 2009 and 2010 respectively.

The Gojeb power plant is Ethiopia's first Independent Power Project (IPP). This 150-MW hydroelectric plant was built in western Ethiopia and started commercial operation in 2004. Agreements on additional IPP projects were signed in June 2001. The largest facility will be the 162-MW Genale hydroelectric facility located on the border between the Oromia Region

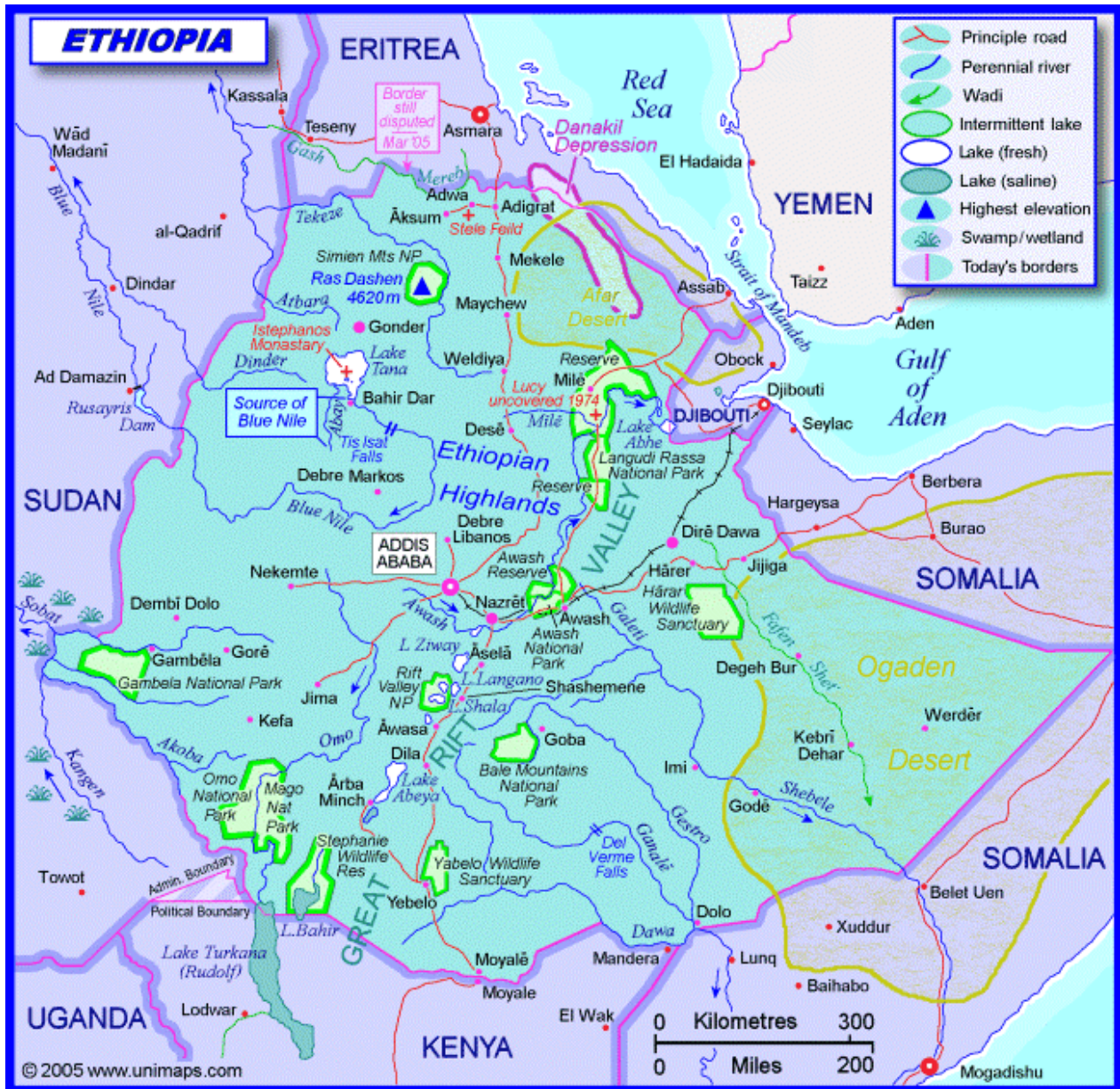
and the Southern Peoples Nationalities Regional State. The plants will be built under the Build-Operate-Transfer (BOT) system. ENERCO will operate the facilities for 30 years, which could be renewable for another 30 years.

#### 3.1.4 Ethiopia-Sudan Transmission Interconnection Project

The Ethiopia-Sudan Transmission Interconnection Project is being implemented under the Nile Basin Initiative under the supervision of the Eastern Nile Technical Regional Office (ENTRO) representing the Eastern Nile countries of Ethiopia, Egypt and Sudan. The Project forms part of the Program on Integrated Development of the Eastern Nile.

The Project involves the construction of a double circuit 230 kV transmission line from Ethiopia to Sudan in order to utilise surplus hydropower from Ethiopia to replace oil-based thermal generation in Sudan. The interconnection would also provide benefits of common reserves in emergency cases (electricity could be transferred from Sudan to Ethiopia under severe hydrological conditions in Ethiopia) and achieve considerable savings in timing of power plants in the long run. Three alternative routes have been investigated and the recommended route is approximately 446 km long, starting from Bahir Dar in Ethiopia and connecting to the El Gedaref Substation in Sudan via the border towns of Metema and Gallabat.

**Figure 3.3 Existing and Committed Hydropower Plants in Ethiopia**



Source: Eastern Nile Power Trade Program Study (EDF, March 2007)

## 3.2 Nile Equatorial Lakes

The East African Power Master Plan Study (BKS Acres, 2005) and the Strategic/Sectoral, Social and Environmental Assessment of Power Development Options in the NEL Region (SNC Lavallin, 2007) provide details on the existing situation of the power sector of the NEL countries and on potential power projects.

### 3.2.1 Current Situation of the Power Sector

In 2007, installed electric generating capacity for the Great Lakes region totalled about 1,914 MW (SNC-Lavallin, 2007), the majority being hydropower. In the framework of the East African Community (EAC), Kenya, Tanzania and Uganda are developing plans to share power supplies, including the EAC Power Master Plan that will enable any EAC country to connect with another nation's electricity supply. Burundi and Rwanda have recently joined the EAC and will therefore participate in the interconnection plan. Among the nations of the region, Uganda has the biggest hydropower potential (from the Nile River) and could play a major part in any power-sharing project.

The electricity demand in Uganda is supplied by two main hydroelectric plants, i.e. Nalubaale (180 MW) and Kiira (200 MW) generating stations, both located about 3 km downstream from the mouth of the Victoria Nile. Other small hydro generating plants include Maziba (1 MW) and Kikagati (1.25 MW but not in operation) located in the southwest, Kilembe Mines (5 MW) and Kasese Cobalt (10 MW) plants, privately owned, located in the west. There are three other micro hydro plants. The Bujagali expansion hydro project and Karuma hydroelectric power station will add an additional 200 MW each to the national grid.

The main transmission voltage in Uganda is 132 kV with the sub-transmission system operating at 66 kV. Generation at Nalubaale and Kiira is transmitted to the east via a 117 km double circuit 132 kV transmission line to the Tororo substation at the border with Kenya. The double circuit line continues to Lessos substation in Kenya. From the Tororo substation a 132 kV transmission line extends 260 km to the northwest to supply the town of Lira. To the west of Nalubaale and Kiira, a double circuit line and a single circuit line serve the load centre of Kampala and the west of the country. A 132 kV line crosses the Tanzanian border and supplies the Kagera region in Tanzania.

The interconnected system in Kenya has a total installed capacity of 1,232 MW made up of 707 MW of hydro, 398 MW of thermal, 127 MW of geothermal, and 0.35 MW of wind.



KenGen, the government owned utility, owns 83% of the generation while independent power producers own the remaining 17% of the effective capacity (BKS Acres, 2005). Generation capacity is expected to be enhanced when ongoing committed generation projects with a combined capacity of 556MW are commissioned between 2007 and 2010 (KPLC Annual report 2006-2007).

There are seven cascaded hydro stations along the Tana River with a total installed capacity of 565 MW and these stations range in size from 7.4 MW to 225 MW. The other major station is the Turkwel hydro station completed in mid 1991 and with an installed capacity of 106 MW.

Kenya has two steam stations, the Olkaria renewable power station (45 MW) and the Kipevu Thermal Station (45.5 MW). Nairobi is promoting additional geothermal power, and plans to commission at least six geothermal power plants, with a combined capacity of 3,894 MW. The government has also identified the northern Kenyan town of Marsabit as a potential site for installation of a wind-powered electricity generation site that would add 4,400MW to the national grid.

Kenya's transmission system comprises 220 kV, 132 kV and 66 kV transmission lines. The system load is concentrated in Nairobi and Mombasa. From Mombasa, a single circuit 132 kV transmission line runs northwest to Nairobi (440 km). From Nairobi a double circuit 132 kV line extends to the Ugandan border and then continues to Nalubaale hydropower station in Uganda passing by Olkaria I and II and Lessos.

The Tanzanian system comprises six hydro plants at Mtera, Kidatu, Hale, Pangani Falls, Nyumba ya Mungu and Kihansi. The total effective hydro capacity of the grid system is 555 MW. The installed capacity of thermal generating sets within the Tanzania grid has increased to 302 MW after the inclusion of 100 MW from an independent power producer i.e. Tegeta thermal power plant which started commercial operation in January 2002. The largest thermal plant is located at Ubungu and is fired by natural gas from Songo Songo.

The transmission voltages in Tanzania are 220 kV, 132 kV and 66 kV, but most energy is carried out on the 220 kV system. Dar es Salaam is the major load centre.

At this time there are no new hydro projects that have been committed. Due to drought, Tanzania is experiencing some power shortages and there is an emergency power plan to

alleviate the shortage. This plan provides for addition of two 40 MW gas fired combustion turbines located near or at Ubungo.

DRC has extensive potential hydroelectric capacity of approximately 100,000 MW. Due to continuing political uncertainties and the resulting lack of investor interest, only a fraction of this amount has been developed. In 2003, the DRC had a total installed generating capacity of 2,568 MW. However, actual production is estimated at no more than 600-700 MW because two-thirds of the turbines are not functioning. In May 2006, MagEnergy (Canada) began overseeing the refurbishment and rehabilitation work on Inga Dam, which is operating at 40%. The repairs should allow Inga to work at full capacity (1,774 MW) by 2010. DRC exports hydroelectricity to its neighbour, Republic of Congo along a 220-kilovolt (KV) connection. The interconnection supplies nearly one third of the electricity consumed in Congo-Brazzaville. Power from Inga is also transmitted to the Zambian grid along a 500-KV DC line from Inga to Kolwezi in southern DRC, and a 220-KV line from Kolwezi to Kitwe in northern Zambia. South Africa also imports DRC's energy output through the Southern African Power Pool (SAPP) grid.

In Burundi and Rwanda, most of the electricity produced is generated through hydroelectricity. Hence, the highly variable climate in central and eastern Africa exposes the power systems of the two countries to great fluctuation in hydropower generation. This has resulted in power rationing of various degrees being introduced in recent years. Even in wet years, there is insufficient reliable energy for supplying new customers and rural electrification. Industrialization processes and, hence, their economic development are severely constrained by the lack of power. The installed capacity in Burundi and Rwanda totals 37 MW and 41 MW respectively (SNC Lavallin, 2007).

### 3.2.2 NELSAP Power Development Strategy

The Strategic/Sectoral, Social and Environmental Assessment (SSEA) of Power Development Options in the Nile Equatorial Lakes Region (SNC Lavallin International, 2007) provides a foundation for planning the development of the power sectors of the region as it contains a proposed development strategy and a NELSAP indicative development plan to the year 2020. It is based on a review of the current environmental and social context, the existing legal and regulatory framework, an assessment of the power needs for the region, an identification of the power development options available in the region and a comparison of these options in terms of environmental, socio-economic and risk considerations. It also

takes into account the conclusions and recommendations of the East African Power Master Plan Study (BKS Acres, 2005).

The following are specific recommendations for a NELSAP Indicative Power Development Strategy based on a medium load growth scenario. Because of the long time required for the construction of power development options, there is little that can be done to improve the power supply situation other than to implement options already committed or under construction and to install units that can be built quickly such as diesel and gas turbine units as well as combined cycle plants, which use expensive fuels. Therefore, the following options, as illustrated on Figure 3.4, are proposed to be implemented during the period 2009 to 2020:

- Gas turbines, combined cycle units and diesel plants (250 MW) in Tanzania;
- Geothermal plant (140 MW) in Kenya;
- Kivu gas engine #2 and # 3 (60 MW) in Rwanda and DRC;
- Rusumo Falls hydropower (62 MW) in Burundi, Rwanda and Tanzania;
- Bujagali 1 to 5 hydropower (250 MW) in Uganda;
- Kabu 16 hydropower (20 MW) in Burundi;
- Kakono hydropower (53 MW) in Tanzania;
- Ruzizi III hydropower (82 MW) between Rwanda and DRC;
- Gas turbines (60 MW) in Kenya;
- Ruhudji hydropower (358 MW) in Tanzania;
- Karuma hydropower (200 MW) in Uganda;
- Wind plants (50 MW) in Kenya;
- Coal-fired plants (200 MW) in Tanzania;
- Coal fired plants (450 MW) in Kenya.

The East African Community Master Plan has proposed a substantial investment in lines within each of the EAC countries. In addition, the plan proposes two interconnection lines:

- 330 kV transmission line Arusha – Embakasi (Nairobi); and
- Double circuit 220 kV transmission line Tororo – Lessos.

The following interconnection lines were also proposed by the NELSAP SSEA:

- 110 kV line from Kigoma, Rwanda to Rwegura, Burundi;
- 132 kV line from Kabarondo, Rwanda passing near Ngara to Biharamuro in the Kagera Province of Tanzania;
- 132 kV line from near Ngara, Rwanda to Gitega, Burundi; and
- 110 kV line from Gitega, Burundi through Bururi to Kigoma, Tanzania.

The DRC has also proposed substantial investments in transmission lines, primarily to interconnect with neighbouring countries and to evacuate power from new or rehabilitation options being considered. These lines include:

- 70 kV from Ruzizi, DRC to Bujumbura, Burundi to be upgraded to 110 kV;
- 70 kV from Bukavu to Goma, both in the DRC to be upgraded to 110 kV;
- 110 kV line between Goma and Beni via Butembo;
- 110 kV line between Mukungwa, Rwanda and Goma, DRC, then on to the proposed hydro plant of Mugomba in Uganda;
- a line between Beni and Bunia to be connected to the existing plant at Budana and the proposed plant at Semliki;
- lines from the Mpiana Mwanga and Kiyimbi plants to the Ruzizi- Bujumbura line;
- a submarine cable linking Kalemie, DRC to Kigoma, Tanzania.

The location of some of these lines was based on the assumption that the Rusumo Hydro option would be built. As currently proposed, it includes transmission lines from the site to Gitega, Burundi; Kabarondo, Rwanda; and Biharamuro, Tanzania.

The power options prevailing in the development strategy consist of hydropower and thermal power plants as well as interconnection transmission lines. Other types of options such as wind farms, geothermal plants and other renewable energy (solar) have a limited capacity, are planned for local needs and do not involve trade with neighbouring countries (regional power market).





#### 4 ENVIRONMENTAL AND SOCIAL FRAMEWORK AND PROCEDURES IN THE NILE BASIN COUNTRIES

The environmental and social policies, legislative frameworks and procedures include all available information related to environmental assessment (EA) of power projects in the NBI countries. Table 4.1 presents the environmental and social issues related to EA of regional power investment projects for which information has been collected in the NBI countries. This section summarises the review of how these environmental and social issues are considered by each NBI country.

Appendix 1 and 2 present respectively the list of documents examined and the stakeholders consulted in the different NBI countries to carry out the review of the EA frameworks and procedures in the Nile basin countries.

The detailed analytical grids on these issues have been presented in the document that was prepared specifically for the mid-term workshop that was held in the framework of this study, and validated by the representatives of the Nile basin countries environmental agencies attending this workshop held in October 2007 at Dar es Salaam, Tanzania.

**Table 4.1 EA-related issues of regional power projects**

<b>Environmental subjects</b>	
1	Environmental policy
2	Environmental and social assessments procedures and regulation
3	Water resources management policy
4	Climate change policies and regulation
5	Forest conservation / Biodiversity policy and regulation
6	International environmental treaties and conventions
<b>Social subjects</b>	
7	Land issues and resettlement policy
8	Poverty reduction strategy and socio-economic development
9	Public health (especially water-borne diseases and HIV/AIDS) policy
10	Vulnerable groups including women policy
11	Historical and cultural sites policy and regulation
12	Indigenous communities policy

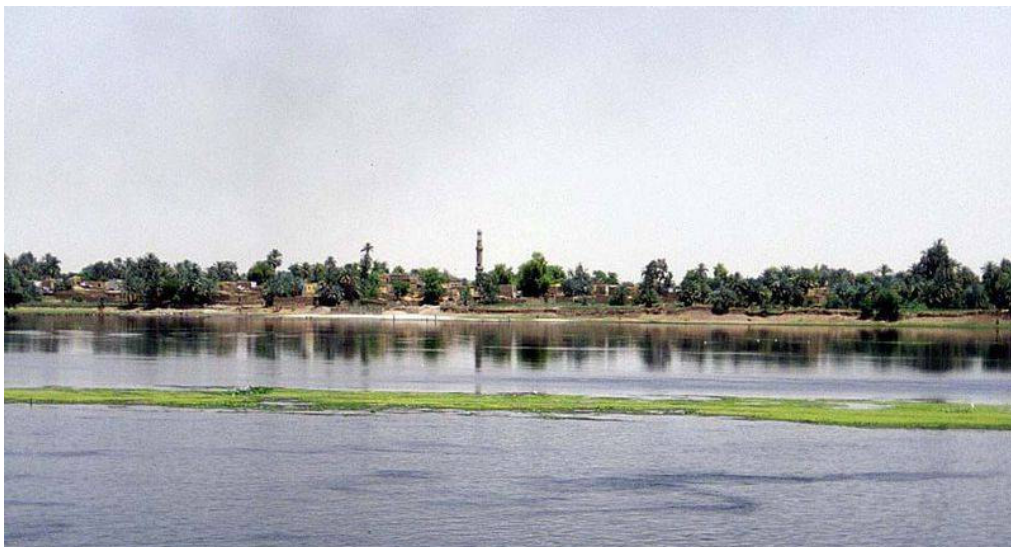
#### 4.1 Environmental policy

Almost all NBI countries have adopted environmental policies and laws in the last ten years. These environmental laws require to carry out the EIA of projects likely to cause environmental impacts. Only the DRC does not have yet a framework law on the environment or a set of environmental policies. However, the Environment Framework Law and the Water Act of DRC are currently in preparation.

The protection and improvement of the environment are integral part of the environmental strategies in the NBI countries. The policies, strategies and sectoral economic plans established on a national scale must consider the environment and sustainable development in their objectives using the action plans identified within this framework, including:

- Rationally use natural resources and ensure their environmental sustainability;
- Develop strategies of protecting and reducing negative effects on the environment;
- Adopt production technologies that do not involve environmental pollution;
- Dispose waste and residues in areas and under conditions established by law;
- Integrate environmental protection in their projects;
- Promote the social welfare of the population considering equal distribution of the existing wealth;
- Consider the durability of the resources with an emphasis especially on equal rights on present and future generations.

*Nile River in Egypt*



Sustainable development, which is a key condition to access to the Clean Development Mechanism (CDM), is not systematically addressed by NBI countries policies. However, Tanzania's National Environmental Policy highlights sustainable development as its core concept. In DRC, the Ministry of Environment is in charge to implement the orientations of



the Forestry Law as far as sustainable development is concerned, including the questions of climate change, deforestation, land degradation and biodiversity conservation.

## 4.2 EIA procedures and regulations

**Burundi, Rwanda and Sudan** have no specific EIA regulations, but only general principles in the environmental law. In general, the law of these countries specifies that when projects, plans or programs pose a potential risk of harming the environment including the population, the governmental authorities will require an environmental impact study in order to assess the impacts of the project and to identify the appropriate mitigation measures. It also provides the contents of an environmental impact assessment report and specific details on the responsibilities. In Sudan in particular, EIAs and SIAs (strategic impact assessment) guidelines are in preparation under a capacity building project. However, any development project should be subjected to EIA.

**RDC** does not have a specific EIA procedure regulation. However, a handbook of environmental and social assessment procedures has been published in September 2006 within the framework of the *Programme Multisectoriel d'Urgence de Rehabilitation et de Reconstruction* (PMURR) funded by the World Bank. This handbook provides all the procedures to carry out when a sub-project of the program is submitted to the EIA framework.

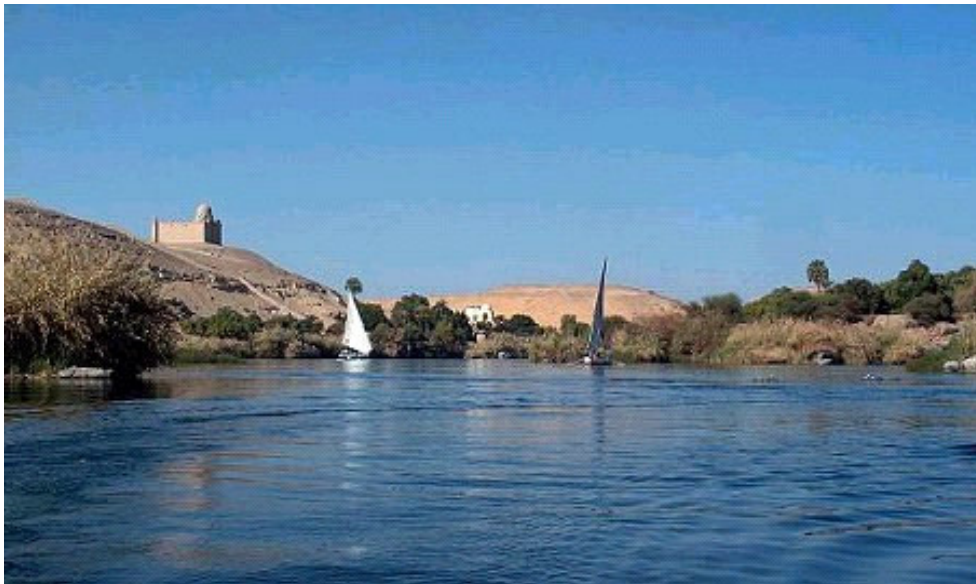
**Egypt** has a comprehensive EIA procedure that is managed by the Egyptian Environmental Affairs Agency (EEAA). Law No. 4 states that the environmental impact of certain establishments or projects must be evaluated before any construction works are initiated or a license is issued by the competent administrative authority or licensing authority. The Executive Regulations relating to Law No. 4 identifies the types of establishments or projects which must be subjected to an EIA based upon the following main principles:

1. Type of activity performed by the establishment.
2. Extent of natural resources exploitation.
3. Location of the establishment.
4. Type of energy used to operate the establishment.

The procedure involves a flexible screening system and projects are classified into three groups or classes reflecting different levels of environmental impact assessment according to severity of possible environmental impacts:

- White list projects for establishments/projects with minor environmental impact.
- Grey list projects for establishments/projects which may result in substantial environmental impact.
- Black list projects for establishments/projects which require complete EIA due to their potential impacts.

*Nile River in Sudan*



The level of the EIA study to submit depends of the list in which the project falls. All power projects fall into the black list and therefore require a full EIA report. For hydropower and thermal power plants projects, the EEAA has prepared EIA guidelines. The decision taken by the authorities regarding the assessment and/or the proposals required to be implemented as considered necessary by the EEAA can be appealed by the developer within 30 days after receiving such decision. However, the classification according to environmental impacts of the projects (white, grey or black) cannot be appealed.

**Ethiopia** has a comprehensive EIA procedure similar to Egypt, through the 2002 EIA Proclamations and the 2003 Environmental Impact Assessment Procedural Guideline. The EIA framework provides lists of projects that require a full EIA, projects that require a preliminary environmental impact study and projects that may not require environmental impact assessment. All projects in environmentally sensitive areas should be treated as equivalent to Schedule 1 (projects requiring full EIA). Such areas include:

- Land prone to erosion;
- Land prone to desertification;
- Areas which harbour protected, threatened or endangered species;
- Areas of particular historic or archaeological interest;
- Primary forests;
- Wetland of national or international importance;
- National Park and protected area;
- Important landscape;
- Religiously important area.

**In Kenya**, the Environmental Management and Coordination Act (1999) make EIA mandatory for all projects specified in the Act. The process begins by the proponent who submits plans for the project and proposes terms of reference for the environmental impact study to the National Environmental management Authority (NEMA), which reviews the plans and terms of reference, determines whether a shorter procedure “Project Report” is sufficient, or whether a full Environmental Impact Assessment Study must be carried out.

The environmental impact study is carried out according to the terms of reference and NEMA issues statement on the project and the study to be public in the gazette and in newspapers of national circulation and in local areas of the project. NEMA also circulates the report to lead agencies and key stakeholders, before reviewing the report and comments made by stakeholders and public, suggests amendments and additions. If no consensus can be reached with respect to opposing interests of stakeholders, NEMA will conclude conditions in the environmental permit to solve these as part of the project.

Finally, NEMA issues environmental permits for the project according to the report, including Environmental Management Plan, eventual Resettlement and Compensation Plan, and eventual conditions, or refuses environmental permit. The whole process is completed in a little more than three months.

**Tanzania’s** environmental registration and regulations of 2005 and the EIA and Audit Regulations of 2005 and guidelines provide guidance and basis for performing environmental assessments and regulation. Under these regulations, environmental experts should be registered with the National Environment Management Council (NEMC).

In Tanzania, EIA is mandatory for projects proposed to be developed within or in proximity to environmentally sensitive/critical areas (ESA), which are areas that are known from experience to be fragile or valuable environment that can be easily harmed or destroyed by effects of the intended development. EIA is also mandatory for projects listed in Appendix 1 of the EIA Guidelines. The definitions in this appendix incorporate an indication of scale, in a form of quantified threshold, which clearly identifies the projects requiring EIA. For projects listed in Appendix 2 of the Guidelines, a preliminary EIA is to be carried out to determine whether a full EIA is needed or not. EIA is required if the particular project in question is judged likely to give rise to significant environmental effects after that preliminary assessment.

The proponent prepares a scoping report and terms of reference for environmental impact assessment of a proposed project and submits to the NEMC for approval. During the baseline study, adequate stakeholder participation must be engaged and the impact assessment shall follow appropriate techniques and approaches as specified in the guidelines issued under the regulations. Concerns and views from stakeholders must be carefully taken into account during assessment of impacts and all possible alternatives and their impacts must be assessed. The most appropriate option must be recommended. The proponent shall also prepare an environmental and social management plan with details about institutional responsibilities, monitoring framework, parameters indicators for monitoring and costs of monitoring when appropriate. The Environmental Impact Statement must be accompanied with non-technical summary in both Kiswahili and English languages.

Finally, **Uganda's** has also a comprehensive EIA framework. The Environmental Impact Assessment Regulations (1998) were enacted by the National Environment Act to make operational the requirements for carrying out environmental impact assessments. They contain detailed procedures for undertaking environmental impact assessments, impact studies as well as environmental audits and monitoring. Since projects related to power projects require large construction, they are subjected to environmental impact assessments.

These regulations shall apply to all projects included in the Third Schedule to the Act. They also apply to any major repairs, extensions or routine maintenance of any existing project which is included in the Third Schedule to the Act. No developer shall implement a project for which environmental impact assessment is required under the Act and under these

regulations, unless the environmental impact assessment has been concluded in accordance with these regulations.

Except as provided for in the Act and these regulations, a licensing authority under any law in force in Uganda, shall require the production of a certificate of approval of environmental impact assessment before issuing a license for any project identified in accordance with sub-regulation of this regulation. An inspector may, at all reasonable time, enter on any land, premises, or other facilities to determine whether a project has complied with the requirements for environmental impact assessment under the Act.

### **4.3 Water resources management policy**

Water resources management in the NBI countries is a critical issue for the socio-economic development of each country and of the region as a whole. To this end, the NBI seeks to develop the river in a cooperative manner, by developing the Nile Basin water resources in a sustainable and equitable way and ensuring efficient water management and the optimal use of the resources.

In **Burundi**, the Law regulates the use of water resources, including licensing, management and quality standards. In addition, the Environment Code (2000) makes it explicit that works and construction likely to modify the hydraulic network ecosystem must be subject to the EIA procedures and cannot be carried out until there is an agreement with the Minister in charge of Environment.

In **DRC**, a draft water code is under discussion. However, the *Loi du 20 juillet 1973 portant régime general des biens, régime foncier et immobilier* states that nobody can pollute water or divert it, which means that all pollution actions must be avoided or remedied through antipollution measures.

In **Egypt**, the Ministry of Water Resources and Irrigation (MWRI) has prepared a National Water Policy till the year 2017 including three main themes: (i) optimal use of available water resources, (ii) development of water resources, and (iii) protection of water quality and pollution abatement.

Water Quality is separately addressed by two laws and three decrees, the most important ones being Law No. 48 of 1982 on Protection of Nile and its waterways and Law 96 of 1962

concerning disposal of wastewaters to municipal sewers. Law 4 of 1994 on Environment plays a significant role in the management and protection of water quality.

**Ethiopia's** Water Resource Management Policy (EWRMP) was set up in 1999. Its objective is to enhance and promote efforts towards an efficient, equitable, and optimum utilization of the available water resources and contribute to the country's socioeconomic development on a sustainable basis.

**Kenya's** Water Act of 2002 provides the institutional and legal framework for implementing the National Water Policy and is the basis of the country's water sector reform currently under implementation. The Water Act of 2002 aims at providing a harmonized and streamlined management of water resources and water supply and sewerage services. The current reform involves the separation of water resources and water and sewerage service provision. It vests all Kenyan water resources in the State and specifies how rights to water usage may be acquired. It creates a corporate body called the Water Resources Management Authority that will, in particular, receive and determine applications of permits for water use. It also creates a Regulatory Board, called the Water Services Regulatory Board, with powers over the provision of water services.

**Rwanda** has a sectoral Policy on Water and Sanitation and a Water Act under preparation. The objective of the law is to define the applicable rules to the use, conservation, protection and management of water resources.

**Sudan** has a water policy which objectives are: (i) Review and adapt water policy to meet changing circumstances within the country, (ii) ensure that the water resources of Sudan are properly managed, protected and efficiently utilized for the benefit of all, (iii) provide the basis for the on-going development of water related regulations and legislation, and (iv) strengthen and clarify the functions and responsibilities of water related institutions in both the public and private sectors in Sudan.

**Tanzania's** policy for Water Resources Management has the objective to promote the sustainable and equitable development and use of water resources. Finally, **Uganda** has a Water Policy and Water Act which provide for the use, protection and management of water resources and supply.

#### 4.4 Climate change policies

All NBI countries have ratified the United Nations Framework Convention on Climate Change (UNFCCC) and are non-annex 1 parties to that Convention. They have also all ratified the Kyoto Protocol. Burundi, DRC, Rwanda, Sudan and Tanzania have developed their National Adaptation Plan of Action that identifies various strategies in each sector of the economy depending on vulnerability to climate change.

*Sand and salt crust*



Burundi has set up a National Strategy of implementation of the UNFCCC, especially for the energy sector by prioritizing hydroelectricity and increasing solar energy.

Egypt has developed its own Clean development Mechanism Strategy undertaken in collaboration with the Ministry of State for Environmental Affairs and Egyptian Environmental Affairs Agency (EEAA). Egypt's strategy on the CDM aims at mainstreaming environment into the relevant sectors and minimizing the environmental impacts of development, through identification of priority policies and planning for their implementation.

The objective of Egypt's CDM strategy is to develop options and opportunities presented by potential international markets for greenhouse gas (GHG) emission reductions through the Clean Development Mechanism (CDM) of the Kyoto Protocol and to identify the institutional

prerequisites needed to participate in the CDM. In order to achieve these objectives, the strategy provides:

- An overview on existing work and earlier initiatives in GHG emission abatement and the CDM in Egypt;
- An assessment of the potential for CDM projects in Egypt in the energy, industry, transportation, solid waste management and forestry sectors;
- An assessment of the demand, size and prices in the international market for emission reductions from CDM projects and the identification of Egypt's opportunities in the market;
- Options and recommendations for the development of the institutional framework and the identification of key capacity building needs that will enable Egypt's participation in the CDM;
- A portfolio of possible CDM projects to facilitate prompt start of the CDM in Egypt.

Ethiopia has developed general sectoral policies which relate to climate change. In Kenya and Tanzania, the need to reduce greenhouse gases emissions is indirectly addressed in energy and environmental laws and in Uganda, the need to reduce greenhouse emissions is specifically addressed in the National Environment Management Policy.

#### 4.5 Forest conservation / Biodiversity

Most NBI countries have a Forestry Code, mostly those of the Nile Equatorial Lakes where forest is abundant, to ensure sustainable forest management. In DRC for example, the Forestry Code indicates that the government will improve environmental management and calls for the adoption of



*Waterfall in Uganda*

specific regulations for that purpose. The Code includes the obligation to consult affected populations but does not explicitly provide for EIAs even if it mentions that EIA are part of modern management of forestry resources. In general, the Forest Code of NBI countries set the rules and regulations governing the management, exploitation and monitoring of forests as well as the forest police force.



In addition, most NBI countries have ratified the 1992 Convention on Biological Diversity prepared during the Earth Summit at Rio, and have developed national strategies and action plans for conservation of biodiversity, including the establishment of protected areas networks.

#### 4.6 International environmental treaties and conventions

The NBI countries are party to several international conventions and protocols that deal with the environment. The most important related to power projects are:

*Nile River delta*



- United Nations Framework Convention on Climate Change and Kyoto Protocol
- Convention Relative to the Preservation of Fauna and Flora in their Natural State
- International Plant Protection Convention
- African Convention in the Conservation of Nature and Natural Resources
- Convention on Biological Diversity
- Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR).
- Convention for the Protection of the World Cultural and Natural Heritage

#### 4.7 Land issues and resettlement policy

Land issues and expropriation procedures are regulated by land related laws in all NBI countries. However, there are differences from one country to another.

In some cases, the laws are quite old. For instance in Sudan, the Land Registration and Settlement Act was enacted in 1925. The Land Acquisition Act, enacted in 1930, outlines detailed procedures to be followed in the acquisition of land and rules governing payment of compensation of land for public purposes.

In other cases, the land regulations are entangled and land issues can not be adequately addressed. For instance, Kenya does not have a clearly articulated land policy and hence

important land issues such as land use, management, tenure, reforms, environmental protection, planning and conflict resolution are currently inadequately addressed through the existing system. Land administration is operated on the basis of outdated legal framework and many legislations, making conveyance a nightmare.

The situation is different in Tanzania where the land policy has been updated in 1999 when the village land act was formulated. However, there still remains confusion in the operation of land policy issues related to customary laws. In Tanzania, there is no resettlement act but the World Bank regulations are followed when resettlement issues arise in projects particularly those financed by the World Bank.

*Kibera - Kenya*

In most countries, the existing laws specify the expropriation procedures in the case of public utility interest projects such as dams or infrastructure projects. In some countries, compensation rates are determined. However, in most case the existing compensation rates and



laws do not cover all aspects of involuntary resettlement such as income restoration of livelihoods and living standards. This situation affects negatively the standard of living of the affected people, in some cases resulting into impoverishment.

Ethiopia does have a national resettlement and rehabilitation policy framework which addresses the importance of compensation payments for the loss of assets at replacement costs, giving opportunities to locals to share project benefits and assisting Person Affected by a Project (PAP) in relocation / rehabilitation.

In many countries, resettlement policy frameworks complying with national regulation and the World Bank safeguard policy OP 4.12 applying to involuntary resettlement, have been developed lately in specific projects funded by multilateral development banks. For instance:

- In 2003, the “Ministère de l’Agriculture et de l’Élevage” of Burundi has developed a Resettlement Policy Framework within the *Projet de Réhabilitation et d’Appui au Secteur Agricole du Burundi (PRASAB)*;
- In 2006, the “Ministère du Plan” of the Democratic Republic of Congo has developed a Resettlement Policy Framework within the “Projet d’Urgence d’Appui à l’Amélioration des Conditions de Vie” (PUAACV);
- In 2006, the “Ministère des Infrastructures” of Rwanda has developed a Resettlement Policy Framework within the “Projet d’Infrastructures et de Gestion Urbaine (PIGU).

However, these frameworks only apply to the concerned projects. They do not constitute national legal frameworks for involuntary resettlement.

#### **4.8 Poverty reduction and socio-economic development**

With the assistance of multilateral development banks mainly the World Bank and the International Monetary Fund, most of the countries have developed poverty reduction strategies summarized in a “Poverty Reduction Strategy Paper” (PRSP). These papers describe a country’s macroeconomic, structural and social policies and programs to promote growth and reduce poverty. They are prepared by governments through a participatory process including the civil society. In addition, there have been constant reviews to update the process for better performance. The countries PRSP can be consulted through the following link:

<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/EXTPRS/0,,menuPK:384207~pagePK:149018~piPK:149093~theSitePK:384201,00.html>

All the poverty reduction strategies are aimed to the achievement of the Millennium Development Goals by 2015. The poverty reduction strategies are the core objectives of the socio-economic development of all countries.

The specific objectives and means of the strategies vary from one country to another depending on the country’s baseline situation and priorities in terms of socio-economic development. However, some general objectives are shared by most of the countries:

- Promote good governance and security: strengthening the rule of law, reforming the justice system, increasing the democratic culture, promoting efficient public administration, pursuing decentralization, tackling corruption, improving security in certain countries through demobilization and disarmament of militants.
- Promote stable, sustainable and equitable economic growth: revitalizing of agriculture as this sector is the source of livelihood of most of the population.

Agriculture is also believed as a potential source to generate primary surplus to fuel the growth of export and industry, strengthening the private sector growth, rehabilitating or upgrading of transport, energy and telecommunication infrastructures, restoration of macro economic equilibrium, prudent monetary and fiscal policies aimed at low inflation, competitiveness, trade and expanding integration in regional or world markets.

- Improve access to social services to develop human capital: targeting the health and education sectors, water supply and sanitation, urban planning and decent housing, social safety nets. In all countries, actions toward vulnerable groups are emphasized. In some of the countries such as Burundi and DRC, some actions are geared toward refugees and the displaced people.
- Fight against the HIV/AIDS pandemic: bring a sharp reduction in the spread of the pandemic through prevention of the transmission, access to medicines, support for affected individuals, families and communities, institutional capacity building and, mitigation of the social and economic impacts of HIV/AIDS.

In each country, these major issues are translated in medium and long term sectoral policies and programs which are to move the countries forward on the human development index.

#### **4.9 Public health policy**

In the NBI countries, the main diseases almost always include malaria, diarrhoea, respiratory infections, sexual related diseases including HIV/ AIDS.

All NBI countries have public health policies aimed to ensure primary health care for all and reduce morbidity and mortality from major causes of illness. Tanzania for instance, has been implementing health reforms to improve the quality health care delivery system to clients. Fighting against HIV/AIDS is part of most public health policies.

In collaboration with the World Health Organization, most of the countries have put in place a specific policy on HIV/AIDS in order to reduce the spread of the pandemic and provide proper care for the affected people. These policies are tackled to the poverty reduction strategies of the countries.

Improving access to drinking water is also addressed by the poverty reduction strategies of the countries. A better access to water is a key issue in the improvement of the access to social services to develop human capital. In the public health policies, water-borne diseases are mainly addressed by programs or actions based on:

- developing water sources and rehabilitate potable water supply systems;

- strengthening water production facilities;
- strengthening existing sanitation programs and expanding them nationwide;
- promoting community management of water supply;
- training and informing populations about hygiene and sanitation techniques appropriate to their environment.

Public health issues related to power projects mainly concern sexually transmitted diseases including HIV/AIDS during construction phase and water-borne diseases during exploitation phase. The NBI countries do not have specific guidelines regarding public health and power projects, apart from those, quite general, developed in EIA guidelines. However, the tendency of international EIA guidelines is to pay an important attention to these issues especially HIV/AIDS.

#### 4.10 Vulnerable groups including women policy

Within their poverty reduction strategy papers, NBI countries identify their vulnerable groups. Depending on the specific social context and history of each country, the vulnerable groups may vary but they are generally identified in the following groups:

*Poor rural people housing*



- rural and urban poor people;
- internal and external refugees or displaced persons;
- households suffering from HIV/AIDS;
- widowed heads of household;
- children;
- the elderly and disabled; and
- orphans (special attention is paid to orphans as the result of HIV/ AIDS disease).

In some case, for instance in Burundi, indigenous communities are identified as vulnerable groups and a special policy has been developed for them.

In order to assist vulnerable groups, the poverty reduction strategies of the countries focus on the necessity to identify the specific needs of these groups to reduce risks of further

vulnerability. They also highlight that particular actions must be engaged to make sure that these needs are taken into account in all sectoral programs and projects.

In addition, the ministry of social affairs of most countries have specific targeted actions for the vulnerable groups under the pillar of social safety nets or social security. The aim of these actions is to help improve the economic and social life of the vulnerable groups whether they be handicapped, widowed heads of household or else.

All NBI countries have recently developed and implemented gender policies to encompass women promotion, gender and equity issues. The principal elements of the policies or strategies are generally as follows:

- empower women economically, politically and socially;
- eliminate all forms of discrimination against women;
- increase the participation of women in decision making;
- raise awareness and increase education;
- establish and coordinate the implementation of campaigns against the violence against women;
- encourage economic projects that promote the status of women while reducing poverty as well;
- integrate gender and equity issues into all policies and development programs.

To some extent, the policies on women are embedded into the policies for vulnerable groups. Particular attention must be given to women's specific needs and specific actions must be taken to ensure the integration of these needs in all programs and projects in the countries development process.

The engagement of NBI countries to enhance the role of women in society varies from one country to another. In Sudan for instance, the government initiated policies and programs in the 1990s but since then, no such initiative has been recorded. Of all NBI countries, Rwanda can be considered as a leader in women's issues. Rwanda applies affirmative action for the promotion of women, for example, 30% of decision-making positions at all levels are allocated to women, women communal funds (micro-credit) have been set-up, women forum structures like the National Women Council have been formed and constitutionalised by the 2003 Rwandan Constitution, article 187. A Gender Monitoring Office has been established under article 185 of the constitution to enable women to participate in and benefit equally from development efforts. Rwanda has a National Gender Policy (NGP) established in 2003.

The goal of the NGP consists in clearly defining the process of integrating gender in all sectors of development and for the promotion of gender equality and equity in Rwanda. Since April 2007, specific strategies have been developed to effectively make Rwanda's NGP operational.

#### **4.11 Historical and cultural sites policy and regulation**

All NBI countries have ratified the 1973 UN Convention concerning the protection of the world culture and natural heritage. In addition, except for Sudan, the countries have laws which aim to protect their national cultural heritage. However, Sudan's environmental policy covers the issue. These laws usually cover at least the following subjects:

- The discovery of any objects related to history, prehistory art or archaeology found during authorized excavations or fortuitously must be notified to the Minister of Culture within a time frame;
- All goods discovered on the national territory and that are relevant to history, prehistory art or archaeology, are part of the national cultural heritage and are subject to classification.

*Nile River in Egypt*



In some countries such as Egypt of course, the laws go much further:

- Creation of lists of the archaeological and historical sites;
- Protection of the archaeological and historical sites;
- Prohibition of the exportation of antique objects without authorization.

Due to its history, historical and cultural sites of Egypt are considered as a very important heritage that must be integrally protected against development. The law governing the protection of Egyptian cultural heritage covers the definition of cultural property, system of ownership, and extension of protection.

Ethiopia's historical and cultural sites policy is a bit different from other countries as it encourages communities to play a leading role in assessing and nominating places or items of heritage significance and in conserving them. Ethiopia's policy promotes a sustainable heritage conservation and management programme that seeks to understand all the elements of the system, their interrelationships and the ways in which each contributes to social and economic development. It promotes the perception of heritage conservation as part of, and integrated with, Ethiopia's general social and economic development

Though, historical and cultural issues are not always covered by national IA regulations, some countries have developed appropriate frameworks within specific projects. For instance in DRC, a Historical and cultural sites policy framework has been elaborated in July 2004 within the Programme Multisectoriel d'Urgence de Réhabilitation et de Reconstruction (PMURR). The document entitled « Cadre de gestion des sites culturels : sites paléontologiques, sites archéologiques, sites historiques et sites naturels uniques », complies with the World Bank O.P. 4.11 safeguard policy on cultural property.

#### **4.12 Indigenous community policy**

Many of the NBI countries have indigenous communities notably Rwanda, Burundi, DRC, Tanzania, Uganda, Kenya and Ethiopia.

Some countries such as DRC and Tanzania have no specific indigenous community policies even though the countries may in fact comprise indigenous communities. In DRC, a law is being considered to promote and protect the pygmies and arrangements exist in the Constitution to protect all minorities and ethnic groups. In Tanzania, the concept of indigenous community does not exist in the law. In the country, there are Hadzabe, Sandawe and Tindiga tribes which are hunters and fruit gathers and are practising traditional styles of living. They live in bushes and wear hide skins or tree barks. The government has not formulated a special policy for these groups but is putting a lot of efforts to transform the groups, by bringing important social services such as school and water closer to them.



Ethiopia and Kenya are in the process of developing indigenous peoples policies. In certain countries such as Rwanda, home to Batwa pygmy communities, the government is still arguing whether or not the Batwas are an indigenous community. The government does not give them that status but does recognize them as vulnerable and marginalized.

A few countries have programs or projects aimed to improve the status of indigenous communities. It is notably the case for Kenya and Burundi.

In Kenya, the Justice and Equality program has started the process of enhancing dialogue, conducting active and strategic advocacy processes and monitoring activities all aimed at mainstreaming the rights of minorities and indigenous communities within the National Action Plan on human rights, Kenya National Commission on Human Rights and other national processes that affect minorities and indigenous communities.



*Batwa housing*

The Dubbed, Dialogue, Advocacy and Monitoring (DAM) project seeks to highlight, promote and protect minority and indigenous peoples' rights. The project objectives are:

- To strengthen the capacity of minority and indigenous communities in Kenya to mitigate the violations of their rights by increasing their access to the Kenya National Commission on Human Rights;
- To highlight, identify and elaborate critical human rights issues among minorities and indigenous communities in Kenya to the media and policy makers with a view to their being recognised and mainstreamed;
- To monitor state compliance with international standards that promote and protect minority and indigenous peoples' rights.

In Burundi, a special project aims at improving the status of indigenous communities. The PRADECS (*Projet d'appui au développement communautaire et social*) established in October 2006, has a plan for the Batwa populations of Burundi based on three specific

issues: 1) institutional opportunities; 2) organizational opportunities and; 3) legal opportunities.

Though Kenya and Burundi have taken important steps to ensure the protection of the rights of indigenous communities, indigenous community policies have not spread out in the NBI countries. It has to be noticed that in the NBI countries where indigenous communities live, projects recently funded by the World Bank are required to develop, when relevant, specific frameworks complying with the Bank 4.10 safeguard policy regarding indigenous peoples.

#### 4.13 Institutional framework in the NBI countries

The national institutions concerned by the regional EA framework for power investment projects are listed in Table 4.2.

**Table 4.2 National institutions concerned by the EA framework for power projects**

Country	EIA regulatory body	Ministry in charge of energy *	Main power utility *
Burundi	Ministère de l'Aménagement du Territoire, du Tourisme et de l'Environnement	Ministère de l'Énergie et des Mines	Régie de Production et de Distribution de l'Eau et de l'Électricité (REGIDESO-SP)
DRC	Ministère de l'Environnement	Ministère de l'Énergie	Société nationale d'Électricité
Egypt	Egyptian Environmental Affairs Agency	Ministry of Electricity and Energy	Egyptian Electricity Holding Co. (EEHC)
Etiopía	Federal Environmental Protection Authority	Ministry of Water Resources Ministry of Mines and Energy	Ethiopian Electric Power Corporation (EPCO)
Kenya	National Environment Management Authority	Ministry of Energy	Kenya Electric Generating Co (KenGen) Kenya Power and Lighting Co. Ltd.
Rwanda	Rwanda Environment Management Authority	Ministry of Infrastructure	ELECTROGAZ
Sudan	Higher Council of Environment	Ministry of Energy and Mining	National Electricity Corporation
Tanzania	National Environment Management Council	Ministry of Energy and Minerals	Tanzania Electric Supply Company Ltd (TANESCO)
Uganda	National Environment Management Authority	Ministry of Energy and Mineral Development	Uganda Electricity Transmission Co. Ltd.

\* The institutions in charge of power planning, generation and transmission have in general environmental units within their organisation. For example in Ethiopia, such environmental units exist within the Ministry of Water Resources, the Ministry of Mines and Energy and the Ethiopian Electric Power Corporation (EPCO).

The consultations carried out with representatives of national environmental agencies of the NBI countries allowed to conclude that they seem quite capable to manage the EA framework proposed in this document for regional power projects. They affirm that they are used to deal with projects submitted to EA and analyse environmental impact assessments (EIA) studies presented to them. However, there are some differences in the level of institutional capability and means from one country to another. Moreover, regional power projects represent major projects for which environmental and social issues must be analysed according to very restrictive international practices and important to comply with in order to ensure the protection of the natural and human components in the Nile basin.

Therefore, an analysis of the institutional capacities in the environmental management of major power projects is essential to better understand the existing level and regional differences of capacities in order to identify in details the required capacity building actions to handle environmental matters and cope with the requirements of the proposed EA Framework. Such an analysis may be divided in four stages:

- Identification of the institutional requirements of the EA framework for regional power projects;
- Individual analysis of each national environmental agency;
- Definition of the capacity building program;
- Reporting.

First, the Consultant mandated to conduct the institutional analysis shall evaluate in detail the requirements in terms of means to establish in each national environmental agency. These means refer to required qualifications of the staff, equipment, and financial resources. Another important aspect to consider is the need in regional coordination required for the implementation of this EA framework. This evaluation shall be completed by the preparation of the profile of requirements to which the national environmental agencies should comply with in order to be capable to implement the EA framework for regional power projects.

Following the initial evaluation, the Consultant shall meet each national agency to analyse its existing situation in comparison with the required profile. This analysis should allow to identify the gaps to fulfil in terms of qualifications, means and financial resources, as well of regional coordination to meet the requirements of the EA framework.

The analysis of gaps will provide the essential information to prepare a comprehensive and quantified capacity building program for each national agency, at short term and long term. In function of the gaps analysis, the capacity building program may include individual or global training sessions. The last step of the institutional analysis will consist in reporting the approach, the gaps identified for each national agency, and the detailed capacity building program with its budget and schedule.

## **5 ISSUES RELATED TO ENVIRONMENTAL ASSESSMENT CONSIDERED BY FUNDING AGENCIES**

This section summarises the review of how the environmental and social issues related to power projects are considered by major international funding agencies, i.e. World Bank, African Development Bank, Canadian International Development Agency and European Union.

### **5.1 Environmental policies**

The four considered funding agencies have developed environmental policies which objectives are quite similar: environmental sustainability, poverty reduction, improvement of the people's quality of life, and protection of the quality of the regional and global environment.

The World Bank's environmental policy framework can be distinguished from the policies of the other funding agencies by its ten safeguard operational policies:

- Environmental Assessment (O.P. 4.01)
- Natural Habitats (O.P. 4.04)
- Pest Management (O.P. 4.09)
- Indigenous Peoples (O.P. 4.10)
- Cultural Property (O.P. 4.11)
- Involuntary Resettlement (O.P. 4.12)
- Forestry (O.P. 4.36)
- Safety of Dams (O.P. 4.37)
- International Waterways (O.P. 7.50)
- Disputed Areas (O.P. 7.60)

These are indeed critical to ensuring that potentially adverse environmental and social consequences are identified, minimized, and mitigated. The O.P. 4.01 is considered to be the umbrella policy for the Bank's environmental safeguard policies. Table 5.1 presents the safeguard policies potentially applicable to regional power projects.

**Table 5.1 World Bank Safeguard Policies potentially applicable to power projects**

<b>Policy</b>	<b>General description</b>
Environmental Assessment (OP 4.01)	Outlines Bank policy and procedures for the environmental assessment of Bank lending operations. Environmental consequences should be recognized early in the project cycle and taken into account in project selection, siting, planning, and design by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts.
Natural Habitats (OP 4.04)	States that the Bank does not support projects involving the significant conversion of natural habitats, unless there are no other feasible alternatives for the project and its siting, and unless comprehensive analysis demonstrates that overall benefits from the project substantially outweigh the environmental costs. If the EA indicates that a project significantly converts or degrades natural habitats, the project must include mitigation measures acceptable to the Bank.
Indigenous Peoples (OP 4.10)	This policy provides guidance to ensure that indigenous peoples benefit from development projects, and to avoid or mitigate adverse effects of Bank-financed development projects on indigenous peoples. Measures to address issues pertaining to indigenous peoples must be based on the informed participation of the indigenous people themselves.
Cultural Property (OP 4.11)	The Bank policy is to assist in cultural property preservation and take actions to avoid their elimination. Specifically, the Bank normally declines to finance projects that will significantly damage non-replicable cultural property, and will assist only those projects that are sited or designed so as to prevent such damage. The Bank will assist in the protection and enhancement of cultural properties encountered in Bank-financed projects, rather than leaving that protection to chance.
Involuntary Resettlement (OP 4.12)	Involuntary resettlement as used in this policy covers both (a) the involuntary displacement (physical and nonphysical) of affected peoples that arises from change in land or water use, loss of productive assets, or loss of income or means of livelihood, whether or not the people move to another location; and (b) the measures for mitigating the impacts of displacement.
Safety of Dams (OP 4.37)	When the Bank finances a project that includes the construction of a new dam, it requires design and construction supervision by experienced and competent professionals. The borrower is also required to implement certain dam safety measures for the design, bid tendering, construction, operation, and maintenance of the dam and associated works. For small dams, generic dam safety measures designed by qualified engineers are considered adequate. For large dams—dams that are 15 meters or more in height, or are between 10 and 15 meters and present special design complexities—the Bank requires special reviews by an independent panel of experts. Review requirements include design, construction, plans for construction supervision and quality assurance, instrumentation, operations and maintenance, and emergency preparedness. The Bank requires prequalification of bidders during procurement and bid tendering and periodic safety inspections of the dam after completion.
International Waterways (OP 7.50)	The Bank recognizes that the cooperation and goodwill of riparians is essential for the efficient utilization and protection of international waterways and attaches great importance to riparians making appropriate agreements or arrangements for the entire waterway or any part thereof. Projects requiring clearance include hydroelectric, irrigation, flood control, navigation, drainage, water and sewerage, industrial, and similar projects that involve the use or potential pollution of international waterways.

## 5.2 Environmental and social assessments procedures

The World Bank and the African Development Bank (AfDB) have quite similar environmental impact assessment procedures, since AfDB's procedures were recently reviewed in order to get harmonised with those of the World Bank. These procedures generally follow the project cycle: identification, preparation, appraisal, loan negotiations, project implementation and supervision, and project completion. For each of these steps, environmental and social aspects to consider are clearly defined within a set of ESIA procedures.

World Bank's OP 4.01 and BP (Bank Procedure) 4.01 define the EA procedure. At the identification phase, screening is carried out by examining the type, location, sensitivity and scale of the project and the nature and magnitude of its potential impacts. The project is then assigned to one of the following four categories, reflecting the potential environmental risks associated with the project:

- **Category A:** A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. For a Category A project, the borrower is responsible for preparing an EIA report, or a suitably comprehensive regional or sectoral EA.
- **Category B:** A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas, including wetlands, forests, grasslands, and other natural habitats, are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A EA. Like Category A EA, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.
- **Category C:** A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.
- **Category FI:** A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

At the preparation phase, the Bank's task team assists the borrower in drafting the terms of reference (TOR) for the EA report, while ensuring adequate interagency coordination and consultation with affected groups and local NGOs. The EA must be carried out in accordance with OP 4.01, national legislation and international environmental agreements.

At the project appraisal phase, the main tasks include the review of the EA results based on the TOR, by paying attention to the consultation process and the environmental management plan (EMP).

The European Commission has developed a comprehensive *Environmental Integration Handbook* in order to assist partner countries to mainstream environment. The EIA process described in this Handbook is quite similar to the procedures of the World Bank and AfDB. The integration of environmental measures is planned throughout all phases of the operations cycle, but emphasis is put on the initial phases of design and preparation as they are of key importance.

EIA screening of projects supported by the European Commission (EC) should be based on national legislation and procedures and on EC criteria which classify individual projects into three categories:

- Category A projects which always require an EIA;
- Category B projects, as well as projects that are not clearly classified, require further information to decide if an EIA is required or not;
- Category C projects do not require an EIA.

An EIA is required for projects that are likely to have significant impacts on the environment. It should be prepared if one the following conditions applies:

- Required for this type of project under national legislation;
- The project is classified as Category A;
- The project is classified as Category B but, considering the particular vulnerability of the recipient environment, the screening process recommends an EIA;
- An existing Strategic Environmental Assessment (SEA) clearly recommends an EIA for this kind of project.



Examples of Category B power projects that will require an EIA are the following:

- The project affects a protected area or other areas classified as vulnerable;
- The project requires the acquisition or conversion of significant areas of land that are important for environmental services;
- The project requires (during or after construction) significant amounts of water, energy, materials or other natural resources;
- The project is likely to result in the production of significant quantities of wastes, especially hazardous or toxic wastes;
- The project produces significant volumes of effluents or air pollutants;
- The project affects important water bodies or significantly affect water regimes;
- The project requires significant accommodation or service amenities to support the workforce;
- The project attracts or displaces a significant population and economic activities;
- There is a risk that the project creates suitable habitats for disease vectors or for pests;
- The project is likely to cause important soil erosion or degradation, considering its activities and its location on steep slopes or vulnerable soils;
- The project affects particular ecosystems, such as natural forests, wetlands, coral reefs, mangroves or habitats of endangered/threatened species; and
- The project is located in or close to a site of high cultural or scenic value.

Following the identification of the project, including screening, the formulation phase includes the scoping and the preparation of the EIA study. Scoping is the operation used to define the aspects that need to be covered in the EIA study. The views and concerns of key stakeholders should be taken into account in defining the scope of the EIA.

After approval of the scoping study by the authorities, the EIA study is carried out and its report should provide conclusions and recommendations regarding (i) the environmental acceptability of the project, (ii) the best alternative and (iii) the measures that should accompany this alternative to mitigate negative environmental impacts and increase positive effects. These measures should be organized in an Environmental Management Plan (EMP), including a monitoring programme. The EMP should be reflected in the project's contractual documents.

Participation and consultation of stakeholders must be integrated in this process within the local institutional framework. Particular care should be taken to (i) make full use of the experience and know-how of the population living in the environment being studied, (b) take

into consideration the needs, values and interests of the population concerned, including women and marginalized social groups. Public participation should be provided for from the earliest stages of the process.

### 5.3 Natural resources management policy

The integrated water resources management approach (including river basin management), defined as a comprehensive approach that views water as a single resource with competing uses and inter linkages with the ecological, social and economic systems, is privileged by the funding agencies when projects and development involve the use of water.

The World Bank's water resources management policy (O.P. 4.07) aims notably at providing water for productive activities, including hydropower, in a manner that is economically viable, environmentally sustainable, and socially equitable. The policy encourages borrower countries to develop and allocate water resources, by considering cross-sectoral impacts in a regional setting (e.g., river basin). The AfDB has a similar water management policy. CIDA and the European Union both supports the achievement of the water targets in the UN Millennium Development Goals, helping countries develop and implement integrated water-resource management plans.

*Nile River in Sudan*

The *OP 4.04 – Natural habitats* prohibits World Bank support for projects which would lead to the significant loss or degradation of any Critical Natural Habitats, whose definition includes those natural habitats which are either:

- Legally protected;
- Officially proposed for protection; or
- Unprotected but of known high conservation value.



In other (non-critical) natural habitats, Bank supported projects can cause significant loss or degradation only when there are no feasible alternatives to achieve the project's substantial

overall net benefits, and acceptable mitigation measures, such as compensatory protected areas, are included within the project.

#### **5.4 Resettlement policy**

Under World Bank OP 4.12 – Involuntary Resettlement, any operation that involves land acquisition or is screened as a Category A or B project for environmental assessment purposes should be reviewed for potential resettlement requirements early in the project cycle. The overall objectives of OP 4.12 are the following:

- (a) Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.
- (b) Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.
- (c) Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

The OP 4.12 covers impacts caused by:

- (a) The involuntary taking of land resulting in: relocation or loss of shelter; loss of assets or access to assets; or loss of income sources or means of livelihood, whether or not the affected persons must move to another location; or
- (b) The involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.

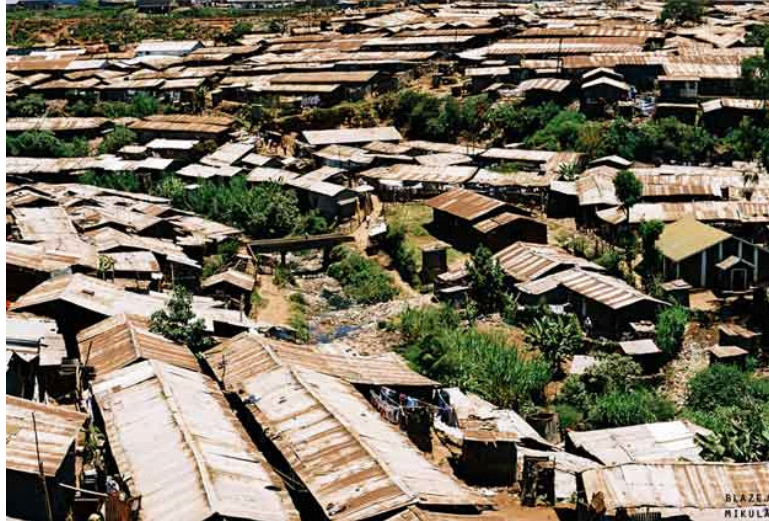
Different planning instruments are used to comply with OP 4.12: Resettlement plan, Abbreviated resettlement plan, Resettlement policy framework, and Resettlement process framework.

- A resettlement plan is a condition of appraisal for all projects that entail involuntary resettlement.
- An Abbreviated resettlement plan may be agreed by the World Bank with the borrower for a project where impacts on the entire displaced population are minor, or fewer than 200 people are displaced.
- A Resettlement policy framework is required for sector investment operations, financial intermediary operations, other World Bank-assisted project with multiple

subprojects and each subproject in a project that may involve involuntary resettlement.

- A Resettlement process framework is prepared when World Bank-supported projects may cause restrictions in access to natural resources in legally designated parks and protected areas.

*Kibera - Kenya*



The resettlement plan covers the elements below:

- socio-economic studies;
- Legal framework;
- Institutional framework;
- Eligibility for compensation;
- Resettlement measures;
- Site selection, site preparation, and relocation;
- Housing, infrastructures and social services;
- Environmental protection and management;
- Community participation by both resettlers and hosts;
- Grievance procedures;
- Organizational responsibilities;
- Valuation and compensation for lost assets;
- Land tenure, land acquisition, transfer and productive re-establishment;
- Implementation timetable, monitoring and evaluation.

## 5.5 Poverty reduction

For the World Bank, poverty reduction is covered under OP 1.00. The Bank is committed to assist in reducing poverty in its member countries. It focuses mainly on integrating poverty reduction objectives in country programming and monitoring progress. The major tool is a poverty assessment that includes a poverty profile of the country and recommendations for government action.

Poverty Reduction Strategy Papers provide the basis for World Bank and IMF assistance as well as debt relief under the HIPC (Heavily Indebted Poor Countries) initiative. According to the World Bank, PRSPs should be country-driven, comprehensive, partnership-oriented, and participatory. A PRSP should be written by a country every three years.

The African Development Bank has adopted in 2004 a policy on poverty reduction with a set of guiding principles based on the major elements of the new conceptual and strategic frameworks. Specifically, it is based on principles of poverty-focus, national ownership, participation of civil society and outcome orientation. Recently, the AfDB has also emphasized the importance of strengthening and rationalizing regional integration schemes, addressing problems of population growth and developing poverty reduction strategies for conflict as well as post-conflict countries. This emphasis on regional integration is specific to the AfDB; it is particularly relevant for the NBI EIA framework for regional power investment projects.

Major measures that the AfDB intends to use to integrate poverty alleviation dimensions in the Bank's interventions include:

- All projects proposed for inclusion in the pipeline should be screened with respect to their possible contribution to the reduction of absolute poverty, and results reflected in the Project Brief.



*Children from Rwanda*

- Projects/programs in the pipeline may be categorized into two categories: P for those with strong poverty reduction focus and G for those with general impact.
- The preparation phase is critical to identify the poor from the population affected, define poverty reduction components and determine the required institutional framework for implementation.
- Project matrices should take into account poverty indicators and beneficiary assessment criteria that would allow monitoring and evaluating the effectiveness of poverty interventions.

The screening of projects with respect to their possible contribution to poverty alleviation and the categorization of projects/programs into categories according to their impact on poverty reduction are good planning practices that should be integrated in the NBI EIA framework for regional power investment projects.

## **5.6 Public health**

Within the World Bank environmental and social assessments procedures, the Occupational Health and Safety issue is identified as an issue that must be reviewed in an EA when applicable. Relevant projects, particularly industry and energy projects, should include formal plans to promote occupational health and safety.

Moreover, human health and safety concerns should be integrated in EA by:

- Introducing the relationship between the environment and health hazards, health risks, and health impacts;
- Screening development proposals for hazards to human health and safety;
- Assessing and quantifying the risks to human health and safety of hazards identified with, or resulting from, projects;
- Developing health risk management proposals as part of the overall environmental management plan (EMP).

There are a variety of health impacts associated with a power project. Possible health impacts include sexually transmitted diseases (STD), HIV/AIDS and accidents resulting during construction activities. Waterborne diseases are other possible health impacts which might result from a project. Waterborne diseases are usually caused by a lack of water supply and sanitation. Access to safe drinking water may be jeopardized as a result of a project in a riparian country or region. Therefore, waterborne diseases impacts should be considered during an Environmental Impact Assessment.

Like the World Bank, the AfDB, CIDA and European Union have made strong commitments to address HIV/AIDS and access of populations to safe drinking water. Consequently, these issues should be addressed in an EIA framework for regional power investment projects.

### 5.7 Vulnerable groups including women

Thru its different policies notably OP 4.12, the World Bank specifies that particular attention must be paid to the needs of vulnerable groups among those affected by a project (in the case of OP 4.12, the displaced people), especially those below the poverty line, the landless, the elderly, women and children, indigenous peoples, ethnic minorities, or other persons who may not be protected through national legislation. Therefore, an EIA should identify the vulnerable groups among those affected and state specific mitigation measures to assist these groups.

The World Bank's OP 4.20 specifically addresses Gender and Development issues. The objective of OP 4.20 is to assist member countries to reduce poverty and enhance economic growth, human well-being, and development effectiveness by addressing the gender disparities and inequalities that are barriers to development, and by assisting member countries in formulating and implementing their gender and development goals.

*Poor African family*

Though only the World Bank addresses vulnerable group issues in its EIA framework, all considered funding agencies address gender issues. For these funding agencies, incorporating gender dimensions in the environmental impact assessment process is compulsory. Therefore, it is recommended that the NBI EIA framework for regional power investment projects include gender issues.



## 5.8 Historical and cultural sites policy

Obviously, historical and cultural property is an issue in the Nile riparian states. Accordingly, this issue must be reviewed in an Environmental Impact Assessment of NBI regional power investment projects. Therefore, it shall be integrated in the EIA framework and procedures. The World Bank OP 4.11 on Cultural Property may be used as a reference for this integration in the project cycle.

*Hieroglyph in Egypt*



The World Bank is the only funding agency with a specific policy regarding historical and cultural sites. According to OP 4.11 – Cultural Property, the World Bank's does not intend to finance projects that will significantly damage non-replicable cultural property and to assist initiatives design to prevent such damage. When cultural property is identified in the project

area, a brief reconnaissance survey must be undertaken to assess the archaeological, paleontological, historical, religious or natural value of such cultural property. The significance of heritage impacts shall be assessed during the preparation phase, and appropriate measures should be developed to avoid, minimize or mitigate the impacts.

## 5.9 Indigenous communities policy

Since 2005, the World Bank has a specific Operational Policy (OP 4.10) dedicated to Indigenous People. According to this policy, the Bank's mission of poverty reduction and sustainable development must ensure that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. Some of the steps projects likely to affect (negatively or positively) indigenous populations have to undertake are:

1. Screening by the Bank to identify whether Indigenous Peoples are present in, or have collective attachment to, the project area;
2. A social assessment by the borrower;



3. A process of free, prior, and informed consultation with the affected Indigenous Peoples' communities at each stage of the project, and particularly during project preparation, to fully identify their views and ascertain their broad community support for the project;
4. The preparation of an Indigenous Peoples Plan or an Indigenous Peoples Planning Framework;
5. Disclosure of the draft Indigenous Peoples Plan or draft Indigenous Peoples Planning Framework (all these steps are detailed in OP 4.10).

### **5.10 Participation / Consultation**

The World Bank and African Development Bank integrate compulsory consultations of the population in the EIA process. The consultation objectives and steps during the EA process are:

- Review national law and practice relating to consultation and ensure compatibility with Bank requirements during the validation of environmental procedures and standards (identification);
- Identify stakeholder groups, secure proponent commitment on consultation program and agree on the extent and mode of consultation (screening or characterisation);
- Identify specific stakeholders, disclose relevant project information and determine stakeholder concerns to include them in the TOR (Scoping and agreement on TOR and schedule);
- Disclose information on study methods and findings, agree on mitigation measures with stakeholders and let stakeholders determine if their concerns are adequately addressed (environmental analysis and production of draft EA);
- Finalize mitigation plan and disclose to stakeholders (production of final EA reports);
- Inform the public about scheduling of potentially disruptive events, disclose results on environmental monitoring, and maintain effective complaints procedure (EMP implementation and monitoring phase);
- Assess effectiveness of consultation process and consult stakeholders for their assessment (final evaluation).

The major tool to plan and implement consultation is the Consultation Plan which should propose a variety of consultation techniques as a function of the audience to reach.

Consultation and participation of the stakeholders of a project being compulsory for the World Bank and the AfDB, it is recommended to integrate these issues in the NBI procedures for regional power investments projects.

### 5.11 Dams Policy

The World Bank OP 4.37 – Safety on Dams requires that experienced and competent professionals design supervise the construction of dams, and that the borrower adopts and implements dam safety measures through the project cycle. In addition, OP 4.37 recommends, where appropriate, that Bank staff discuss with the borrowers any measures necessary to strengthen the institutional, legislative, and regulatory frameworks for dam safety programs in those countries.

The Bank distinguishes between small (less than 15 m high) and large (more than 15 m) dams. Dams between 10 and 15 m high are treated as large dams if they present special design complexities (unusually large flood-handling requirement, location in a zone of high seismicity, etc.). For large dams, the Bank requires (i) reviews by an independent panel of experts of the investigation, design, and construction of the dam and the start of operations; (ii) preparation and implementation of detailed plans; (iii) prequalification of bidders during procurement and bid tendering; and (iv) periodic safety inspections of the dam after completion.

### 5.12 International Waterways Policy

The Operational policy 7.50 – Projects on International Waterways of the World Bank applies to (i) any water body that forms a boundary between or that flows through two or more states; (ii) any other water body part of the watershed of a waterway described in (i); and (iii) any bay, gulf, strait, or channel bounded by two or more states or, if within one state, recognized as a necessary channel of communication between the open sea and other states.

*Nile River*



This policy applies to the following types of projects:

- Hydroelectric, irrigation, flood control, navigation, drainage, water and sewerage, industrial, and similar projects that involve the use or potential pollution of international waterways;
- Detailed design and engineering studies of above-mentioned projects.

Projects on international waterways may affect the relations between the World Bank and its borrowers, and between riparian states. Therefore, the Bank attaches great importance to the riparians making appropriate agreements or arrangements for the entire waterway, or parts thereof, and stands ready to assist in this regard. In the absence of such agreements or arrangements, the Bank requires, as a general rule, that the prospective borrower notifies the other riparians of the project. The Policy lays down detailed procedures for the notification requirement.



# MODULE 3

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Chapters 6 to 11

