４－６　環境社会配慮調査実施体制

４－６－１　調査実施体制の検討

C/P 組織の環境専門スタッフは少なく、体制強化が望まれる。

本調査では、F/S 調査実施体制の強化を目的として、ウガンダ国内で Steering Committee の下に、ウガンダの生態系や同国立公園の状況に詳しい専門家から成る Environmental Advisory Group を設け、助言を受けることを先方に提案し合意しているが、Environmental Advisory Group の責務、役割、運営方法等を明確にする必要がある。

F/S 調査の実施体制案を図４－12 に示す。

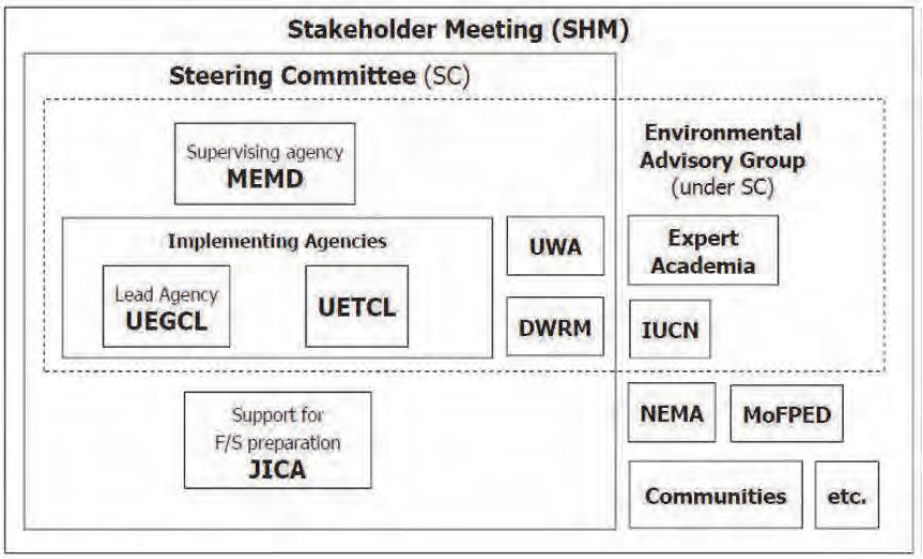


図４－12　F/S 実施体制案

現時点では Environmental Advisory Group に参加する専門家は未定であり、F/S 調査開始前までに先方がリストアップする予定となっている。C/P との打合せでは、現時点の委員候補として NGO（WCS、IUCN）、NBI、政府系研究機関などを想定している。

IUCN や WCS とは本調査において個別に打合せを行っている。いずれも本事業に協力的である。IUCN はブジャガリ HPP の EIA に参加した経験があり、WCS はウガンダ内の生物調査の実績を数多く有しているほか、2011 年 7 月、8 月に WCS の保有する航空機で MFNP 全域の航空写真を撮影している（Enso-Mosaic システムで 80cm まで解析可能）。この航空写真は有料で提供可能であるとのことであるが、料金等の詳細情報は未入手であるため、F/S 調査で確認する必要がある。

IUCN や WCS などの世界的な NGO の参加は、F/S 調査の体制強化及び C/P の技術レベル向上に役に立つとともに、F/S 調査の客観性を担保するうえで重要な意味をもつ。この客観性は、ウガンダ政府の意向に左右されないという意味で重要なことでもある。

F/S 調査では調査の円滑な遂行、ウガンダの環境管理能力向上、ドナーとの関係の持続的発展が可能な調査実施体制の構築が求められる。

４－６－２　モニタリング体制の検討

本調査でレビューした Karuma 水力発電所及び送電線建設の EIA には、多くの項目について対策及びモニタリング項目が列挙されている。これは前述したように、これらの事業が自然保護区内という高度に環境社会配慮を求められる場所に位置していることと深く関係している。F/S 調査ではこのような地域の特殊性を考慮したうえで EIA の作成に即応できる内容をめざすことから、調査結果を EIA のベースとして随時 C/P に提供することにより F/S 調査と並行して C/P が EIA を作成することは可能であろう。

EIA に記載された対策や特にモニタリングは、対策の実施状況及びその効果、問題発生の有無等をチェックし､問題があれば速やかに対応策を提言することが重要な業務であることから、高度な知識と経験を有する技術者によって適正に実施される必要がある。

４－６－３　UWA の強化の必要性

（1）国立公園・自然保護区管理における UWA の法的位置づけ

MTTI によれば、国立公園に関する景観保全を含む観光関連業務はすべて UWA が管轄しているとのことであった。本調査ではこれ以上の情報を得られなかったため、UWA の国立公園・自然保護区管理における UWA の法的な位置づけ、MTTI と UWA との権限分掌等について、F/S 調査で確認する必要がある。

（2）組織強化・キャパシティビルディング

UWA は自然保護区における生態系の管理、密漁の取り締まり、モニタリングなど、その業務範囲は極めて広く、自然保護区管理に絶大な権力を有している。しかしながら、その財務基盤は脆弱であり、ドナーの資金援助なしにその活動は成立しないのが実情である

UWA が管理する国立公園の外人観光客は UWA の重要な資金源のひとつであると同時に、ウガンダにとっても重要な外貨獲得源でもある。本事業においても F/S 現地調査時におけるレンジャーのガイド・護衛、動物モニタリング情報の利用など UWA に依存するところが大きい。また、石油開発事業の今後の展開を考えた場合、石油生産の開始、精油所の建設など、UWA が今以上に国立公園の環境保全に力を入れなければならない状況が発生すると予想される。

World Bank OP4.04 では､WB が自然生息地への潜在的な負の影響を伴うプロジェクトを支援するかどうかを判断する際、「WB は、借入人が適切な保全策や緩和策を実施できるかどうかを考慮する。制度面の能力に関する潜在的な問題がある場合、当該プロジェクトには効果的な環境計画・管理を行うために国家及び地方の制度面の能力を開発するコンポーネントが含められる。当該プロジェクトで指定されている緩和策は、国や地方での実践能力強化に役立つものと思われる。」との記載があり、UWA の組織・体制の強化は本事業における重要な活動のひとつとして取り上げるべきものと考えられる。

F/S 調査では、UWA の財務、組織・体制、活動計画、人材などについて分析・評価し、UWA の支援及び強化策を提言するとともに、現地調査、ワークショップ/セミナー等により UWA に対しても環境社会配慮に関する技術移転を行い、ウガンダの国立公園・自然保護区の管理能力向上のための方策を検討する必要があろう。

４－７　環境社会配慮 TOR 案

４－７－１　目　的

アヤゴ水力 F/S 調査において、水力発電所及び送電線建設に係る自然環境及び社会環境に及ぼす影響を予測・評価し適切な対応策を検討するとともに、ウガンダの国立公園・自然保護区の管理能力向上のための方策を検討することを目的とする。

４－７－２　調査対象範囲

アヤゴ水力発電所及び送電線建設予定地周辺及び MFNP 並びにカルマ野生生物保護区に隣接する地域。

４－７－３　調査内容

(1) 基本情報の収集･整理

1) ウガンダの環境法規及びガイドライン、WB Safeguard Policy、IFC Performance Standard 等について、水力発電所及び送電線建設に係る環境社会配慮に関する最新情報を収集・整理する。

2) 既存の EIA や文献・資料を収集し、国立公園や自然保護区における水力発電所及び送電線建設事業における環境社会配慮事項や予測手法、対策、モニタリング方法等を整理する。

3) ウガンダの大学、NGO、ローカルコンサルタント等について、実績、人材、経験等に関する情報を収集・整理する。

(2) ウガンダの国立公園・自然保護区の管理能力向上

1) 調査実施体制の強化

本調査を通してウガンダにおける国立公園・自然保護区の管理能力の向上を図る。そのためには、実効性のある調査実施体制の構築が必要である。具体的には、ステアリング・コミッティ、Environmental Advisory Group、C/P の責任、役割の明確化、Environmental Advisory Group における適切な専門家構成及び活動内容の規定、信頼性のあるモニタリング体制構築などがあり、これらを考慮して調査実施体制の強化策を検討する。

2) キャパシティビルディング

調査期間中、現地調査、ワークショップ/セミナー等により環境社会配慮に関する技術移転を行い、ウガンダの国立公園・自然保護区の管理能力を向上させる。技術移転の対象は C/P 及び UWA を含むものとし、管理能力向上のための具体的な方策を検討する。

3) UWA の体制強化

UWA の財務、組織、体制、人材、活動等について分析・評価して問題点を抽出し、UWA の支援及び体制強化策を提言する。

(3) 環境社会配慮調査

環境社会配慮調査は、本事業の EIA のための基本資料を作成することを目的とすることから、将来的な 200MW 増設へのドナーの参加を考慮して以下の環境社会配慮ガイドラインに準拠して報告書を取りまとめる。

- JICA Guidelines Environmental and Social Considerations Appendix 2. EIA Reports for Category A Projects
- World Bank OP 4.01, Environmental Assessment Annex B - Content of an Environmental Assessment Report for a Category A Project
- IFC PS1 Social and Environmental Assessment and Management Systems, Guidance Note 1 Annex A Content of SEIA Report

1） 既存資料・情報の収集・整理

アヤゴ地区及び影響域内の自然及び社会環境に係る既存資料を収集するとともに、関係機関、大学、NGO、ドナー等へのインタビュー調査を行い、調査遂行上必要な情報を整理する。

2） 代替案の検討

M/P 調査で検討した代替案について必要に応じて修正・補足あるいは再検討を行う。

3） 影響域の設定

本事業活動による影響域を決定する。

4） スコーピング

本調査において検討すべき項目を抽出し、それらの調査方法、頻度等を決定する。

5） 現地調査

スコーピング結果に基づき、調査計画を立案し現地調査を実施する。調査時期は現地の気候特性等を考慮して年間の変動が把握できる時期とし、期間は原則 1 年間とする。調査項目は以下を含むものとする。なお、括弧内の調査回数は参考値とするが、騒音･振動については UWA から 3 回の要望が出ている。

① 大気：建設工事等に伴う影響項目について（2 回測定）
② 水質：建設工事等に伴う影響項目等について（2 回測定）
③ 環境騒音・振動：建設工事等に伴う騒音･振動について（3 回測定）
④ 交通量、道路交通騒音・振動：資機材輸送車両のルート等について（2 回測定）
⑤ 地形・地質：危険箇所及び災害履歴等について（1 回調査）
⑥ 水生生物：希少生物、工事現場及び減水区間等について（2 回調査）
⑦ 動物：希少生物、工事現場及び減水区間、カバ、ワニ等の希少生物のハビタット調査等について（2 回調査）
⑧ 植物：希少生物、工事現場及び減水区間等について（2 回調査）
⑨ 住民聞き取り調査：MFNP 及び KWR と住民との関わり等について（1 回調査）
⑩ 社会経済：人口、世帯数、職業、人種構成、土地利用、産業、インフラ等の地域社会経済項目について（1 回調査）
⑪ 少数グループ：言語、風習等の異なるグループの文化人類学的調査等について（1 回調査）
⑫ 文化遺産：遺跡、墓地、聖地等について（1 回調査）
⑬ 景観：主要な景観資源及び視点場、眺望特性、利用状況等について（2 回調査）
⑭ 用地買収：カルマ変電所付近の土地所有状況、UETCL による用地買収状況等について（1 回調査）
⑮ コンクリート骨材の原石山：有望な原石山の詳細について（1 回調査）

6） 影響予測・評価

工事中及び供用時ごとに本事業実施に伴う正負の環境影響について予測･評価を行う。対象項目は前項①～⑮を含むものとし、アヤゴ水力発電所閉鎖時の環境影響（Decommissioning Impact）及び本事業による累積的環境影響についても検討の対象とする。

供用時に出現する減水区間については、ダムからの放流水量（正常流量）の解析手法や生態系評価手法を使用して減水区間における適正維持流量及び生態系への影響を検討する。予測条件は出力 100MW 時、200MW 時、300MW 時の 3 ケースを基本とする。

景観についてはチョベロッジ等の重要な視点場からのモンタージュ作成等による景観の変化及び観光業への影響を検討する。

7） 対　策

工事中及び供用時ごとに予測された負の影響についての緩和策を検討する。

8） モニタリング

工事中及び供用時ごとに必要な項目についてモニタリング計画を検討する。

9） 環境管理計画（EMP）

環境管理計画には項目別に上記 6）～8）を取りまとめ、環境管理体制、モニタリング体制、責任機関等を明示する。

４－７－４　調査工程（案）

ウガンダの気候特性及び各調査項目の適切な調査実施時期等を考慮して環境社会配慮調査に係る調査工程表（案）を作成する。

第５章　F/S 調査の協力内容及び留意事項

５－１　アヤゴ水力発電所整備事業の留意事項

５－１－１　調査の目的

本調査はアヤゴ水力発電所計画及びアヤゴ水力発電所からカルマ水力発電所の開閉所までの送電線計画から成る本事業の目的、概要、事業費、事業実施体制、運営・維持管理体制、環境及び社会面の配慮等、わが国有償資金協力事業として実施するための審査に必要な調査を行うことを目的として実施される。なお、アヤゴ水力発電所計画のうち、Phase I-1（100MW）と送電線が有償資金協力の候補案件として、調査を実施する。

５－１－２　調査の対象地域

ウガンダ西部地域 Kiryandongo District、北部地域 Nwaya District（アヤゴ水力発電所及び送電線計画地点）及びその周辺地域（環境社会影響エリアを含む）

５－１－３　実施機関（相手国関係機関）

主たる C/P は、水力発電計画部分については UEGCL が、送電計画部分については UETCL である。しかし、計画地点が国立公園内でもあることから、本格調査時に設立されるステアリング・コミッティがウガンダ側の運営組織となった体制が十分に機能することが本格調査の実施にあたって不可欠である。また、特に UEGCL で C/P として対応する技術者が量的に不足していることから、人員の補充による組織強化が求められる。特に、マスタープラン策定プロジェクト実施時には不在であった土木、地質に対応できるエンジニアが F/S の段階ではより必要となることから、これらの技術に対応できる体制を期待する。

５－１－４　留意事項

F/S 調査では、まず M/P 調査のなかで実施された Pre-F/S のレビューを通じ、総設備容量 600MW 全体計画の概観の確認を実施し、引き続き、第 1 次開発（Phase I）300MW の発電所及び送電線についての F/S を作成する。そのうちの第 1 期開発（Phase I-1）100MW 分の事業については、円借款案件形成の観点から、焦点を当て調査を行う。F/S の対象となる Phase I の主要諸元を表５－１に示す。

表５－１　アヤゴ水力発電計画（Phase I、300MW）

項　目	諸　元
総落差	87m
最大使用水量	420m^3/s
取水堰	コンクリート重力式　高さ 15m、堤頂長 250m
導水路トンネル	コンクリート巻立式　条数 3 本、延長 113m/条
水圧管路	条数：3 本～6 本、延長 85m/条
放水路	コンクリート巻立式　条数 3 本、延長 7,400m
発電所	地下式　幅 23m×高さ 40m×長さ 150m
水　車	立軸フランシス水車　51MW/unit×6units

項　目	諸　元
発電機	55.5MW/unit×6units
主要変圧器	屋内式　13.2kV/400kV，容量　111.2MVA 6 units (Unit 1-6)

調査実施にあたっての留意事項は以下のとおりである。

（1）Pre-F/S のレビュー

アヤゴ水力発電計画部分については、Pre-F/S において設定された最適規模 600MW について、確認を行う必要がある。この確認においては、Pre-F/S 実施後の（水運用、電力需給等）状況、開発計画との整合、維持流量を考慮しての流量検討を考慮する必要がある。また、同時に開発規模に加えて、第 1 期開発等アヤゴ水力開発計画の開発時期等、開発スキームについての確認も行う必要がある。

送電線部分については、環境の側面、特に景観からの観点で選定されているルートの妥当性及び代替案の可能性を考慮したうえでの、基本的な送電線ルートの確認を行う必要がある。

（2）F/S（設計）の実施

測量及び地質調査結果を基に発電計画の基本設計を実施する。取水堰については、施工性及び環境を考慮した設計を行う必要がある。水路構造物についても環境影響を考慮した設計を行う必要がある。特に、地下発電所については、その概略の位置、形状検討を行い、その結果を用いて、発電所の概略レイアウトを確定させる必要がある。

送電線については、アヤゴ発電所の開閉所を含めて、景観を含む環境社会影響（国立公園内だけではなく国立公園外のカルマ開閉所までの区間にも十分配慮を行うこと）を十分考慮した送電線ルート及び設計を行う必要がある。また、送電線の設計については、特にカルマ変電所への接続部については、カルマ変電所の位置、形状、工程等の情報を十分に考慮したうえで、関係機関と十分な協議を行い、実施する必要がある。

（3）測量調査の実施

Pre-F/S では航空測量による概略地形図を用いたが、F/S では実地測量による詳細地形図の作成が必要である。河川測量についても、構造物の設計のみならず維持流量の検討のために広範囲の測量が必要である。この調査業務は再委託での実施が想定され、その想定される調査項目及び数量は、表５－２に示すとおりである。ただし、F/S 調査レベルで必要な調査数量については、過剰にならないよう調査実施に際し、更に精査する。

表５－２　地形測量（案）

Item	Unit	Quantity
1. Topographic 1：1,100	km^2	10
2. River Cross Section	Lines	150
3. Others	L.S.	1

ただし、環境影響配慮での状況次第では、ミティゲーション対応等のために 1/10,000 地形測量（20km^2）程度の追加、あるいは 1/1,000 地形測量、河川横断測量の数量変更の可能性がある。

（4）地質調査の実施

Pre-F/S では、堰と地下発電所並びに取放水口のボーリングを中心に実施しているが、F/S では、代替案の地下発電所や水路のボーリング調査も行うことが必要となる。そのほかに、広範囲に延びる水路の地質性状を把握するための弾性波探査や、地下発電所の設計に資するボアホール TV の実施が望ましい。この調査業務は再委託での実施が想定され、その想定される調査項目及び数量は、以下のとおりである。ただし、F/S 調査レベルで必要な調査数量については、過剰にならないよう、更に精査する。なお、ボアホール TV 調査は、高度な技術、機器が必要となる調査であり、ウガンダ業者による実施可能性についての事前確認が必要であり、その状況次第では、第三国業者への再委託により実施が必要となる可能性がある。

表５－３　地質調査（案）

Item	Unit	Quantity
1. Core drilling		
Length　30m	Holes	15
Length　50m	Holes	6
Length 130m	Holes	9
2. Borehole TV observation		
Length 130m	Holes	8
3. Seismic Prospecting		
Total 12km line (11.5km, 0.25km x 2)	L.S	1
4. Ground mapping		
1：10,000	km^2	30
1：1,000	km^2	3
5. Laboratory Test		
Physical and mechanical Test	L.S	1
Construction material	L.S	1
Dissolution test for excavated material	L.S	1
6. Others		
(Access road, Mobilization and demobilization, Safety Management, Report etc.)	L.S	1

（5）系統安定解析及び単機容量の検討

Pre-F/S では潮流、事故電流解析を対象とした検討を行っているが、200km 以上の長距離送電でもあり安定度が系統の健全運転の支配要因となる可能性がある。このため F/S にお

いては、より信頼度の高い送電系統を実現するため、系統安定度解析の実施が必要である。

（6）施工計画・積算

1） 施工計画策定

Pre-F/S では、主に図面を用いて仮設用地や土捨て場の位置を設定していることから、F/S 時には、地形測量のデータに基づき、環境影響の低減も念頭に置いたうえで、最適な場所と規模を決定する必要がある。

2） 工事費の積算

Pre-F/S では、概算数量と市場単価に基づき概算工事費を算定しているため、F/S においては、数量と単価の精度を更に向上させる必要がある。特にウガンダでは地下工事（地下発電所、トンネル等）の実績がないため、単価の設定にあたっては、近隣国の実績調査やコントラクターからの見積もりを含め慎重に検討することが求められる。

（7）実施体制、運営維持管理体制の確認

実際の発電所・送電線の運用実例を参考とし、ウガンダでの電源構成、技術者の有無等の実態を十分に考慮した現実的なプロジェクトの収益向上に資する適切な運営、維持管理システムの提案を行うことが求められる。

５－１－５　調査の具体的内容

本調査の対象事業はアヤゴ水力発電所とアヤゴ水力発電所からカルマ変電所までの送電線である。アヤゴ水力発電所（出力 600MW）は保証出力分の Phase I（300MW）及び 2 次電力分の Phase II（300MW）の大きく 2 段階で開発される計画であり、Phase I については更に電力需要に沿って 100MW 単位で開発される計画である。円借款の対象事業は Phase I のなかの第 1 次開発分、Phase I-1（100MW）である。このため、1）については、計画全体を対象とするが、2）～4）については Phase I-1 に焦点を当てながら下表に示す Phase I（アヤゴ水力発電所 300MW 分と送電線）を対象として調査を実施する。

調査内容を箇条書きにすると、以下のとおりと考えられる。

1） 事業の必要性・電力需要など背景の確認

1-1 ウガンダにおける経済、産業開発に関する上位政策の確認及びエネルギー政策の確認

1-2 経済、産業政策や人口動態等に伴う電源開発の必要性の確認及び長期電源開発計画の確認

1-3 ウガンダの系統拡充計画（既存系統の連系計画含む）、電力潮流予測の確認、東部アフリカパワープールの電力需要想定の確認

1-4 ウガンダ全体におけるアヤゴ水力の位置づけ及び国内の電源開発計画の確認

1-5 ウガンダ全域及び周辺国の将来の電力需給を用途別（産業・商業・家庭）・需要別に確認

1-6 ウガンダ全域における日系企業の活動状況、投資計画に対する本事業のインパクトの確認

1-7 ウガンダ全域における対日本輸出向けの資源の発掘、製品の製造に対する本事業のイ

ンパクトの確認

1-8　建設資材・機材・人的資源等のリソースの入手可能性とコストの確認

1-9　ウガンダにおける水力発電所の運用、事故対応等に係る事例、実績の確認

1-10 ウガンダにおける環境社会配慮関連法規、関係機関、水力開発や送電線開発に関する参考事例の確認

1-11 上記を踏まえた本事業全体の必要性、妥当性の確認

1-12 段階開発の妥当性の確認

1-13 詳細な現地調査計画の策定

2）　事業スコープの確認

2-1　水力開発マスタープランの Pre-F/S 調査結果に記載されている事業スコープ（発電所、送電線）の検証、Pre-F/S のアップグレード

2-2　本事業のコンサルティング・サービス TOR 案（技術協力の必要性・スコープを含む）についての提案

2-3　全体事業費及び円借款対象事業費の積算

2-4　円借款候補案件として最適計画策定等を通じたコスト縮減策等の検討

2-5　事業実施スケジュール案の策定

2-6　調達パッケージの提案

3）　実施体制、運営維持管理体制の確認

3-1　実施機関（UEGCL 及び UETCL）の事業実施体制、財務健全性、技術的能力等の確認（MEMD 及び実施機関による体制強化方針・計画、他ドナーが実施している能力強化支援の内容、及びそれらの実施状況の確認を含む）

3-2　既存の水力発電所の運営維持管理体制の現状を踏まえた本事業の運営・維持管理体制の提案

3-3　アヤゴ水力発電所の効率的運用に資する適切な運営、維持管理システムの検討

3-4　アヤゴ水力発電所の保守運用体制の確認

3-5　アヤゴ水力発電所の保守運用における技術支援ニーズの確認

4）　プロジェクト評価

4-1　運用・効果指標の提案

4-2　貧困削減効果の推計

4-3　本事業受益者の特定

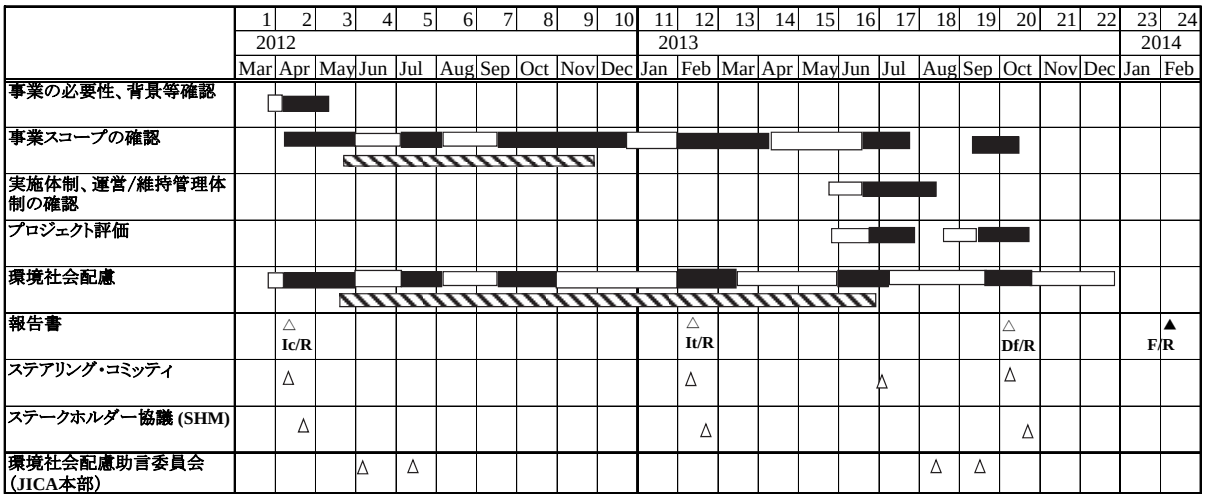
4-4　経済財務分析（EIRR 及び FIRR の算出）

4-5　定性的効果分析

4-6　CO_2 削減量の算出

５－１－６　工程表（案）

本調査は、2012 年 3 月上旬に開始し、約 24 カ月後の 2014 年 2 月下旬の終了をめどとする。調査工程及び各報告書の作成時期は、めどとして図５－１に示すとおりとする。



Remarks ☐: 日本国内作業
■ ウガンダ現地調査
▨ 現地再委託調査
Ic/R: Inception Report, It/R: Interim Report, Df/R: Draft Final Report, F/R: Final Report

図５－１　工程表（案）

５－２　環境社会配慮に関する留意事項

５－２－１　調査実施体制の強化

C/P 組織の環境専門スタッフは人数も少ないことから F/S 調査実施体制の強化を目的として、ウガンダ国内でステアリング・コミッティの下にウガンダの生態系や同国立公園の状況に詳しい専門家から成る Environmental Advisory Group を設け、助言を受けることを先方に提案し合意しているが、Steering Committee - Environmental Advisory Group - C/P の責務、役割分担、運営方法等を明確にする必要がある。

Environmental Advisory Group については、有力な国際的 NGO を構成員として、助言だけでなく調査に直接参加できるようなスキームの検討も一案である。本調査で面談した IUCN や WCS は本事業に好意的であり、調査への協力を約束している。

F/S 調査では、業務の円滑な遂行、ウガンダの環境管理能力向上、ドナーとの関係の持続的発展等を目的として実効性のある調査実施体制の構築が求められる。

５－２－２　モニタリング体制の充実

EIA に記載された対策やモニタリングが記載どおりに実施されることは重要であるが、特にモニタリングは、対策の実施状況及びその効果、問題発生の有無等をチェックし、問題があれば速やかに対応策を提言する極めて重要な業務であることから、高度な知識と経験を有する技術者によって適正に実施される必要がある。

F/S 調査においては、モニタリング体制の充実を図るための方策を検討する必要がある。

５－２－３　Karuma 水力発電所及び送電線建設事業の情報収集

本調査で収集した Karuma 水力発電所及び送電線建設事業の EIA は以下のとおりである。

- 発電：Karuma Hydro-Power Project (600 Mw) Environmental and Social Impact Assessment Volume II, MEMD, July 2011

- 送電：Karuma Interconnection Project Environmental & Social Impact Assessment Volume I, UETCL, March 2011

発電 EIA については RAP Report（Vol. IV）が存在しているのを確認しているが、それ以外の EIA 別巻については情報がない。送電 EIA についても同様である。また、UETCL によれば、本事業の接続先カルマ変電所付近の民有地は買収される予定であり、本事業において民有地の買収は発生しないであろうとのことであったが、用地買収終了時期などの詳細情報は未入手である。

カルマ変電所の情報は本事業と密接に関係するため、他の関係 EIA 別巻も含めて F/S 調査において情報収集する必要がある。

５－２－４　UWA の体制強化

前述のとおり、UWA は自然保護区における生態系の管理、密漁の取り締まり、モニタリングなど、その業務範囲は極めて広く、自然保護区管理に絶大な権力を有している。しかしながら、その財務基盤は脆弱であり現状を踏まえ、F/S 調査では、UWA の財務、組織・体制、活動計画、人材などについて分析・評価し、UWA の支援及び強化策を提言することが必要になる。

５－２－５　維持流量の検討

Karuma 水力発電所における減水区間の維持流量 100m^3/s は、Tennant 法によって決められていたことが分かった。しかしながら、Tennant 法は米国の暖冷水（Warm- and Cold- Water）を対象とした経験学的な方法であり、熱帯のナイル川に直接適用するにはかなり無理があると考えられる。また、この方法は基本的に魚類の生息環境と流量との関係を調べる手法であり、カバやワニ､岸辺の植生を含む水辺の生態系への影響を把握するには不十分な手法であると考える。

最近ではダムからの放流水量（正常流量）解析手法として、Aquatic Baseflow (ABF; USFWS 1981)、Instream Incremental Methodology (IFIM; Bovee 1982)、Habitat Quality Index (HQI; Binns and Eiserman, 1979)などが使用されている。また、生態系評価手法としては、US Fish & Wildlife Service が開発した Habitat Evaluation Procedures（HEP）、湿地の損失とミティゲーションによる代償分を定量的に評価する Hydrogeomorphic Approach（HGM）などがある。わが国においても国土交通省・河川局「正常流量検討の手引き（案）平成 19 年 9 月」などがあり、F/S 調査では、これらの手法を使用して減水区間における適正維持流量を検討する必要がある。なお、維持流量算定の際には、予測条件として出力 100MW 時、200MW 時、300MW 時の 3 ケースを基本とし、それぞれのケースにおける適性維持流量と環境影響を検討する必要がある。

５－２－６　現地の環境特性の把握

カルマ発電・送電プロジェクトの EIA に記載された影響と対策を見ると、通常の流れ込み式水力発電所建設 EIA には記載されていない事項が数多く見られる。これらはアフリカ、ウガンダにおける国立公園・自然保護区での開発事業という特殊な環境下での環境社会配慮活動から蓄積された経験であり、このようなノウハウは現地の専門家や関係機関が保有していると考えられる。

F/S 調査では、国立公園や自然保護区における過去の EIA や既往の知見を収集し、具体的な対策事例を検討するとともに、現地の専門家や関係機関へのヒアリング等による情報収集を行

い、現地の環境特性を考慮した調査計画を策定する必要がある。

５－２－７　骨材の入手

M/P レポートでは、コンクリート用骨材等の材料の入手先として、MFNP 及び KWR の地域のほかに複数の原石山候補地を検討しているが、現状では骨材の入手方法は確定していない。

F/S 調査では骨材供給先を精査するとともに、骨材製品輸送ルート及び方法を検討し、必要な環境影響予測と対策を検討する必要がある。また、本事業サイトで骨材プラントを設置して掘削岩石を骨材として利用するのであれば、骨材プラントの騒音対策や破砕・選別工程で発生した製品にならない廃石の処分方法などについても検討する必要がある。

付　属　資　料

１．M/M（写）
２．要請書
３．質問票

THE MINUTES OF MEETINGS
ON
THE MISSION FOR THE PREPARATORY SURVEY (TOR MISSION)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA
AGREED UPON BETWEEN
THE MINISTRY OF ENERGY AND MINERAL DEVELOPMENT,
UGANDA ELECTRICITY GENERATION COMPANY LTD.,
UGANDA ELECTRICITY TRANSMISSION COMPANY LTD.,
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY

The Ministry of Energy and Mineral Development (hereinafter referred to as "MEMD"), Uganda Electricity Generation Company Ltd. (hereinafter referred to as "UEGCL"), Uganda Electricity Transmission Company Ltd.(hereinafter referred to as "UETCL"), and the Japan International Cooperation Agency (hereinafter referred to as "JICA") have made several preliminary discussions in order to identify priority projects of hydropower development, and agreed to conduct further study for Ayago Hydropower Project(hereinafter referred to as "the Project").

Accordingly, JICA dispatched a mission on the Project (hereinafter referred to as "the Preparatory Survey (TOR Mission)")to Uganda from 9th to 23rd October in order to develop scope and implementing arrangements of a further survey which will study feasibility of the Project (hereinafter referred to as "the Preparatory Survey (F/S: Feasibility Study)"). The scope and implementing arrangements of the Preparatory Survey (F/S) are described in the Appendix 1. The main points discussed during its visit are described in the Appendix 2.

It should be noted that implementation of the Preparatory Survey (TOR Mission) does not imply any decision or commitment by JICA to extend its loan for the project at this stage.

Kampala, 18 October, 2011

Mr. F.A. Kabagambe-Kaliisa Permanent Secretary Ministry of Energy and Mineral Development	Mr. Teruyuki Ito Director Electric Power Division Industrial Development and Public Policy Department Japan International Cooperation Agency

Mr. John Mugyenzi
Managing Director
Uganda Electricity Generation Company Ltd.

Mr. Eriasi Kiyemba
Managing Director/ CEO
Uganda Electricity Transmission Company Ltd.

(Witnessed by)

Mr. Lawrence K. Kiiza
Director Economic Affairs
Ministry of Finance Planning and Economic Development

Appendix 1: Scope and Implementation Arrangements of the Preparatory Survey
Appendix 2: Main Points Discussed
Appendix 3: AttendanceList

SCOPE AND IMPLEMENTATION ARRANGEMENTS OF THE PREPARATORY SURVEY

I. BACKGROUND AND OBJECTIVES OF THE PREPARATORY SURVEY

The power demand in Uganda has been increasing rapidly and the growth rate of power demand continues to be around 8% according to the Grid Development Plan 2009-2025 (hereinafter referred to as "GDP2009"). Peak demand presently stands at about 450MW and it is projected to be about 1,130MW in 2023 based on the GDP2009. Meanwhile, in the present circumstances, there is an insufficient generation infrastructure of installed capacity of about 600MW in total and there are occurrences of frequent power shortage in the country. Despite the National Development Plan (NDP) urges to encourage foreign investments and export with high value addition to achieve accelerated and sustainable economic growth with poverty eradication, today, Uganda is facing serious constraints to continue economic development due to a lack of sufficient electricity generation capacity.

To tackle this issue, the government has been making efforts in power sector development by utilizing hydropower potentials of which technically feasible potential of large scale hydro power generation is more than 2,000MW. As a result of the Project for Master Plan Study on Hydropower Development conducted from 2009 to 2011, it was found that large scale hydro was superior to the other energy sources. Although geothermal had balanced advantages in the aspect of environmental impacts and other technical point of view, technically feasible potential was about 50MW at present which was not sufficient to meet the demand in the future. Finally the Ayago Hydropower Project (hereinafter referred to as "the Project") was identified as one of the optimal project which were to be installed by 2023 as well as indicated as a priority project in the NDP. Pre-F/S was also conducted as a part of the Master Plan Study.

For the Project, it was recommended that its development is to be undertaken in a phased manner based on the findings of the Hydropower Master Plan Study conducted by MEMD and JICA. Hereby, it was agreed that the firm capacity portion of Ayago Hydropower Project with 300MW is called as the Phase I and the secondary portion of 300MW is called as the Phase II. The Preparatory Survey (F/S) is aimed to analyze the feasibility of the Phase I by focusing on an initial implementation of 100MW of the Project (Phase I -1) in order to satisfy requirements for formulation of ODA-Loan Project. Phase II will be considered by reviewing pre-F/S as medium term development plan of the Project.

II. OUTLINE OF THE PROJECT SUBJECT TO REVIEW BY THE PREPARATORY SURVEY

1. Objectives

The Project aims at constructing the Ayago Hydropower Plant and 400kV power transmission line between the Ayago Hydropower Plant and Karuma switchyard. Through the transmission line, electricity from Ayago is to be transmitted to Kawanda substation which is in one of the suburbs of Kampala in order to improve power supply situation mainly in major towns of Kampala, Entebbe and Jinja, as well as exports of power in the East African region which will contribute to

socio-economic development of the country and the region.

2. SCOPE OF THE PROJECT (summarized below)

(1) Project Site

Hydropower plant: Ayago, Kiryandongo District
Transmission Line: From Ayago to Karuma substation, Kiryandongo District

(2) General description of the Project

- Run of river type hydropower plant
- Installed capacity: 600MW
- Transmission line: 400kV, 2cct, 58km
- Access road: 130km

(3) Scope of the Project (Phase I)

- Installed capacity: 300MW

(4) Scope of the Project (Phase I-1)

Principal feature of the Project (Phase I-1) is as summarized in the table below.

Item	Description
General description	• Run of river type hydropower plant • Installed capacity: 100MW • Transmission line: 400kV, 2cct, 58km • Rated head water level: 852m • Tail water level: 765m • Effective head: 80m • Plant discharge: 140m3/s • Power House (see below)
(1) Weir	• Weir: concrete weir with 15m height and 245m crest length.
(2) Intake	• 3 gates
(3) Headrace	• 1 pressure flow tunnel with inner diameter of 8.4m and length of 113m
(4) Steel penstock	• 1 tunnel with inner diameter of 8.4 to 5.4m and total length of 87.9m
(5) Tailrace	• 1 free flow tunnel with inner diameter of 8.4 and length of 7,450m
(6) Underground Powerhouse	• Machine bay and erection bay cavern with inner height of 40m, inner width of 23m and length of 150m. • Transformer and GIS Room cavern with inner height of 20.5m, inner width of 18m, and length of 67m.
(7) Access road	• 130km
(8) Turbine	• Vertical-shaft, single-runner, Francis turbine • Turbine output x number: 51,200kW x 2
(9) Generator	• Three-phases, Synchronous Generator • Rated output x number: 55,600kVA x 2
(10) Switchyard	• Type: GIS (Gas Insulated Switchgear), 400kV
(11) Transmission line	• 400 kV T/L from Ayago Hydropower Plant to Karuma switchyard 2 cct ±58km, conductor type of ACSR

(5) Executing Agencies, Coordinating Mechanisms

Line ministry: Ministry of Energy and Mineral Development (MEMD)

Executing agencies (Phase I-1)

Hydropower: Uganda Electricity Generation Company Ltd. (UEGCL)

Transmission Line: Uganda Electricity Transmission Company Ltd. (UETCL)

III. SCOPE OF THE PREPARATORY SURVEY (F/S)

The Preparatory Survey (F/S) is aimed to analyze the feasibility of the Phase I by focusing on an initial implementation of 100MW of the Project (Phase I -1) in order to satisfy requirements for formulation of ODA-Loan Project. Phase II will be considered by reviewing pre-F/S as medium term development plan of the Project.

1. Terms of Reference

The Preparatory Survey (F/S) shall cover the following items.

(1) Introduction

In response to the request of the Government of Uganda, the Government of Japan decided to conduct the Preparatory Survey (F/S) on Ayago Hydropower Project.

Accordingly, JICA, the official agency responsible for the implementation of Official Development Assistance (ODA) of the Government of Japan, will undertake the Preparatory Survey (F/S) in close cooperation with the MEMD, UEGCL UETCL and other authorities concerned in Uganda.

(2) Objectives of the Preparatory Survey (F/S)

The Preparatory Survey aims at formulating the optimum plan and assessing the technical, economic, financial, environmental and social viabilities of the Project (Phase I) in close cooperation with Ugandan counterpart personnel and at recommending further process of the project implementation.

(3) Scope

The Preparatory Survey (F/S) will be conducted on the basis of the pre-F/S which was carried out as a part of the Project for Master Plan Study on Hydropower Development conducted from 2009 to 2011. The Preparatory Survey (F/S) would accommodate needs of technical transfer as much as possible. The TOR (i) covers Phase I and II of the Project and TOR (ii) to (v) cover Phase I of the Project to which implementation of Phase I-1 will be given focus. The tentative schedule of the Preparatory Survey (F/S) is shown in the schedule attached and the following data and information will be collected and analyzed.

(i) Necessity of the Project

1-1. Confirmation of energy sector development policies

1-2. Confirmation of power development plan and current progress of development in energy sector

1-3. Demand forecast data including industrial, commercial and regional development plan in Uganda, as well as demand in the East Africa Power Pool

1-4. Availability and cost of construction materials, machinery, equipment and construction workers

1-5. Review and confirmation of the necessity and appropriateness of the Project

1-6. Review appropriateness of phased development of the Project

1-7. Plan on detailed field investigation

(ii) Project Components

2-1. Review of the Pre-F/S undertaken in 2010 and update of the Project scope and preliminary design
2-2. Conduct of field investigation, including topographic survey, geological investigation, construction material test
2-3. Implementation of Hydrological survey
2-4. Layout design and Optimization
2-5. Upgrading pre-F/S design
2-6. Cost Estimation and construction planning
2-7. Proposal of consulting service and technical assistance under the project
2-8. Review of the Project cost with breakdown and background information based on the review of the Project specifications (Review should include the confirmation of the composition of foreign and local currencies and the range of tax (value added tax and import tax) exemptions.)
2-9. Study of cost reduction measures
2-10. Identification of the project risks
2-11. Proposal of the project implementation schedule
2-12. Proposal of the organizational structure for the project implementation
2-13. Proposal of procurement package of the Project

(iii) Operation, Maintenance and Management

3-1. Confirmation of technical and financial capacity of UEGCL and UETCL
3-2. Proposal of appropriate operation, maintenance and management system to enhance project output
3-3. Confirmation of operation and management framework for hydropower plant
3-4. Confirmation of needs for technical assistance for operation and management of hydropower plant

(iv) Project Evaluation

4-1. Proposal of operation and evaluation indicators of the Project
4-2. Identification of project beneficiaries
4-3. Calculation of EIRR and FIRR
4-4. Evaluation of qualitative effect from the project
4-5. Calculation of greenhouse gas (GHG) emission reduction in line with JICA requirements

(v) Environment and Social Consideration

5-1. Confirmation of the legislation and institutional framework for the environmental and social safeguards in Uganda, including environmental laws and regulations, and guidelines
5-2. Confirmation of the JICA Guidelines for Environmental and Social Considerations (April 2010) and relevant international standards including World Bank Safeguards Policies and International Finance cooperation (IFC) Performance Standards
5-3. Review of related regulations and laws (category of zoning of national parks, regulation for nature reserve, etc.)
5-4. Identification of the location and areas to be affected by the Project
5-5. Implementation of scoping to choose alternatives for analysis, a range of significant and potentially significant impacts, and study methods based on the Pre-F/S
5-6. Implementation of baseline survey on the items selected by scoping, including water quality, noise and vibration, aquatic and terrestrial lives, archaeological resources,

visual resources, indigenous or ethnic people, socio economics, and land acquisition and resettlement

5-7. Assessment of project impacts and examination of mitigation measures
5-8. Preparation of environmental management plan and environmental monitoring plan (including cost and budget)
5-9. Provision of supports to stakeholder meetings
5-10. Monitoring of the progress of EIA implementation and provision of technical supports
5-11. Confirmation of the measures for gender awareness and mainstreaming in the Project
5-12. Confirmation of the measures for awareness and prevention of sexually transmitted infection including HIV/AIDs in the Project

2. Desirable specialists for the Preparatory Survey (F/S)

JICA will select and dispatch a survey team to carry out the Preparatory Survey (Phase I). The team will include the following specialists.

(1) Team leader/ Hydropower planning specialist
(2) Civil design (weir)
(3) Civil design (Waterway and power house)
(4) Construction planning and cost estimation
(5) Electro-mechanical equipment
(6) Hydrology
(7) Geology/Topography
(8) Transmission line
(9) Power system analysis
(10) Natural environment (ecosystem) /GIS
(11) Natural environment (biology)
(12) Social impact considerations
(13) Economic and financial analysis
(14) Operation coordinator/ civil design

The assignment of the specialists may be subject to change. The Survey team may engage local consultants, NGOs, and/or other supporting staffs.

IV. SCHEDULE OF THE PREPARATORY SURVEY

The Preparatory Survey (F/S) will be carried out in accordance with the tentative schedule attached as the Annex 1. The schedule may be subject to change during the preparation and the course of the survey.

V. REPORTS

JICA will prepare and submit following reports in English to MEMD, UEGCL and UETCL.

1. Inception Report

12 copies will be submitted at the commencement of the first work period in Uganda. This report will cover outline, contents and schedule of the Preparatory Survey (F/S)

2. Interim Report

12 copies will be submitted 6 months after the commencement of the Preparatory Survey. This

report will cover findings in the middle of the Preparatory Survey.

3. Draft Final Report
   12 copies will be submitted at the end of the last work period in Uganda. MEMD, UEGCL and UETCL shall submit its comments within one month after the receipt of the Draft Final Report.

4. Final Report (1)
   12 copies will be submitted within one month after the receipt of the comments on the Draft Final Report. Final Report (1) is to be disclosed to the public. However, it is noted that Final Report (1) does not contain the information related to the Project including the design drawings, technical specifications, consulting services, estimated cost with breakdown and background information and procurement package for the Project for smooth implementation of tendering.

5. Final Report (2)
   12 copies will be submitted within one month after the receipt of the comments on the Draft Final Report. Since the information related to the Project including the design drawings, technical specifications, consulting services, estimated cost with breakdown and background information and procurement package for the Project are included, Final Report (2) should never be duplicated or disclosed to any outside parties before the conclusion of all contracts for the Project. However, it is noted that the Final Report(2) may be disclosed to the public on request based on Japan's Law concerning Access to Information held by administrative Organization. JICA will consult with the MEMD UEGCL and UETCL as to the contents and sections to be disclosed.

VI. UNDERTAKINGS OF THE GOVERNMENT OF UGANDA

The UEGCL and UETCL shall act as a main counterpart agency to the survey team and also as a coordinating body with other organizations concerned for the smooth implementation of the Preparatory Survey (F/S). MEMD is to provide necessary support to UEGCL and UETCL in undertakings.

UEGCL and UETCL shall, at their own expense, provide the survey team with the following items in cooperation with other organizations concerned:

(1) security-related information as well as measures to ensure the safety of the survey team;
(2) information as well as support in obtaining medical services;
(3) data and information related to the Preparatory Survey (F/S);
(4) counterpart personnel;
(5) suitable office space with necessary equipment and secretarial service;
(6) credentials or identification cards;
(7) arrangement of meetings such as Steering Committees and Stakeholder Meetings
(8) entry permits and associated costs incurred for the entry to the Murchison Falls National Park necessary for the survey team members to conduct field surveys as well as workers for topographic survey, geological survey and environmental and social considerations survey;
(9) support in making transportation arrangements;
(10) support in obtaining other privileges and benefits if necessary;
(11) assist the team in custom clearance, exempt from any duties with respect to equipment, instruments, tools and other articles to be brought into and out of Uganda in connection with the implementation of the survey; and
(12) MEMD, UEGCL and UETCL shall bear claims, if any arises, against the members of the survey team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in implementation of the Preparatory Survey (F/S), except when such claim arise from gross negligence or willful misconduct on the part of the member of the

survey team.

VII. CONSULTATION

JICA, MEMD, UEGCL and UETCL shall consult with each other in respect of any matter that may arise from or in connection with the Preparatory Survey (F/S).

IX. OTHERS

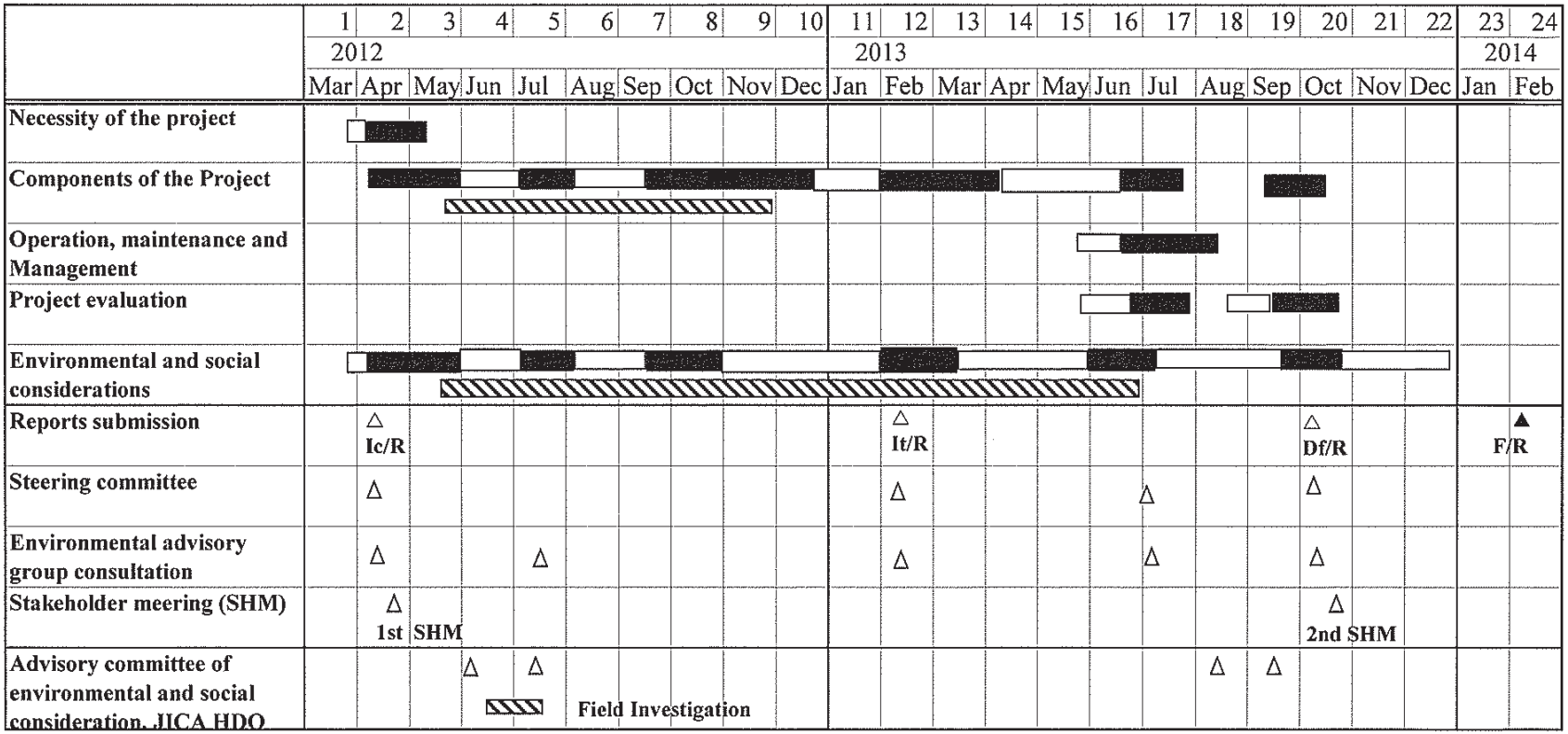
It is understood that the Ugandan side would make an official request to the Government of Japan for financing after scrutinizing outcomes and recommendations of the Preparatory Survey (F/S).

END

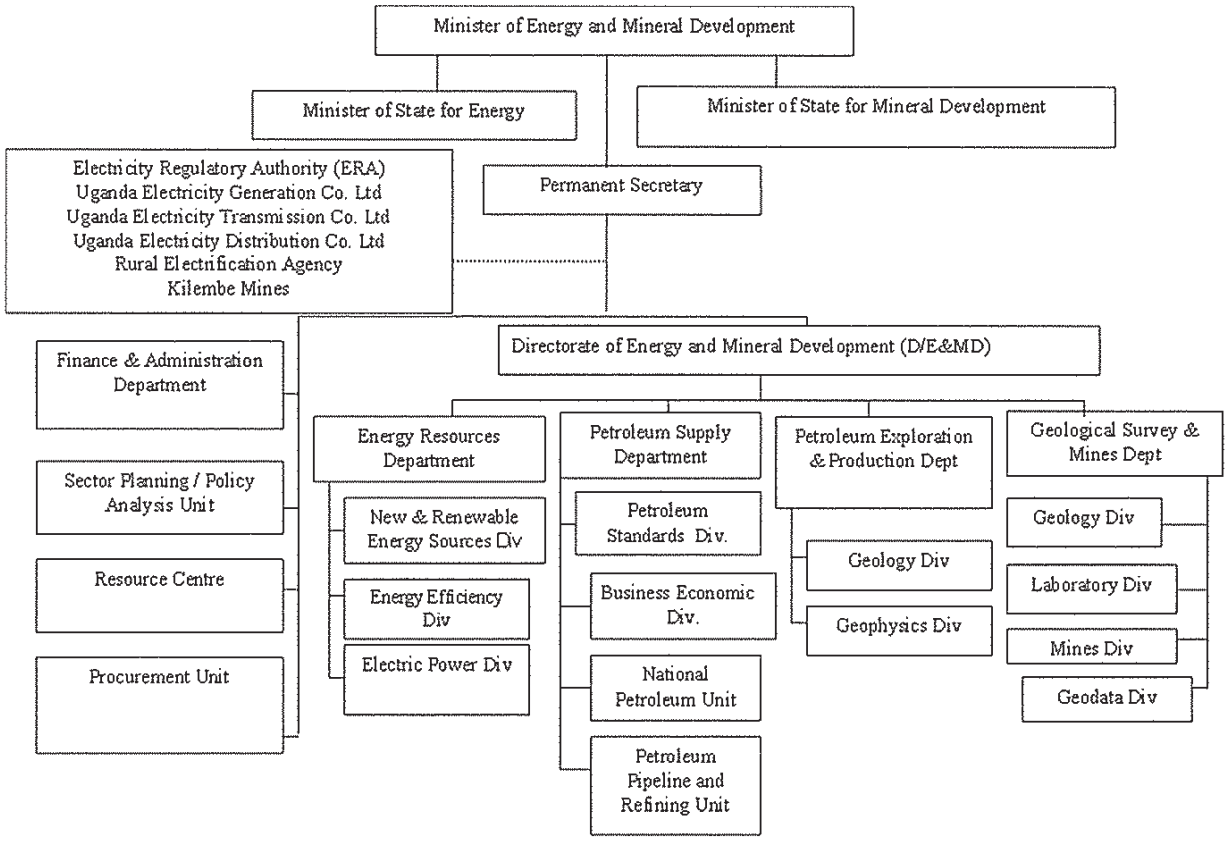
Annex 1: Tentative Schedule
Annex 2: Organization chart of MEMD, UEGCL, UETCL

Annex 1

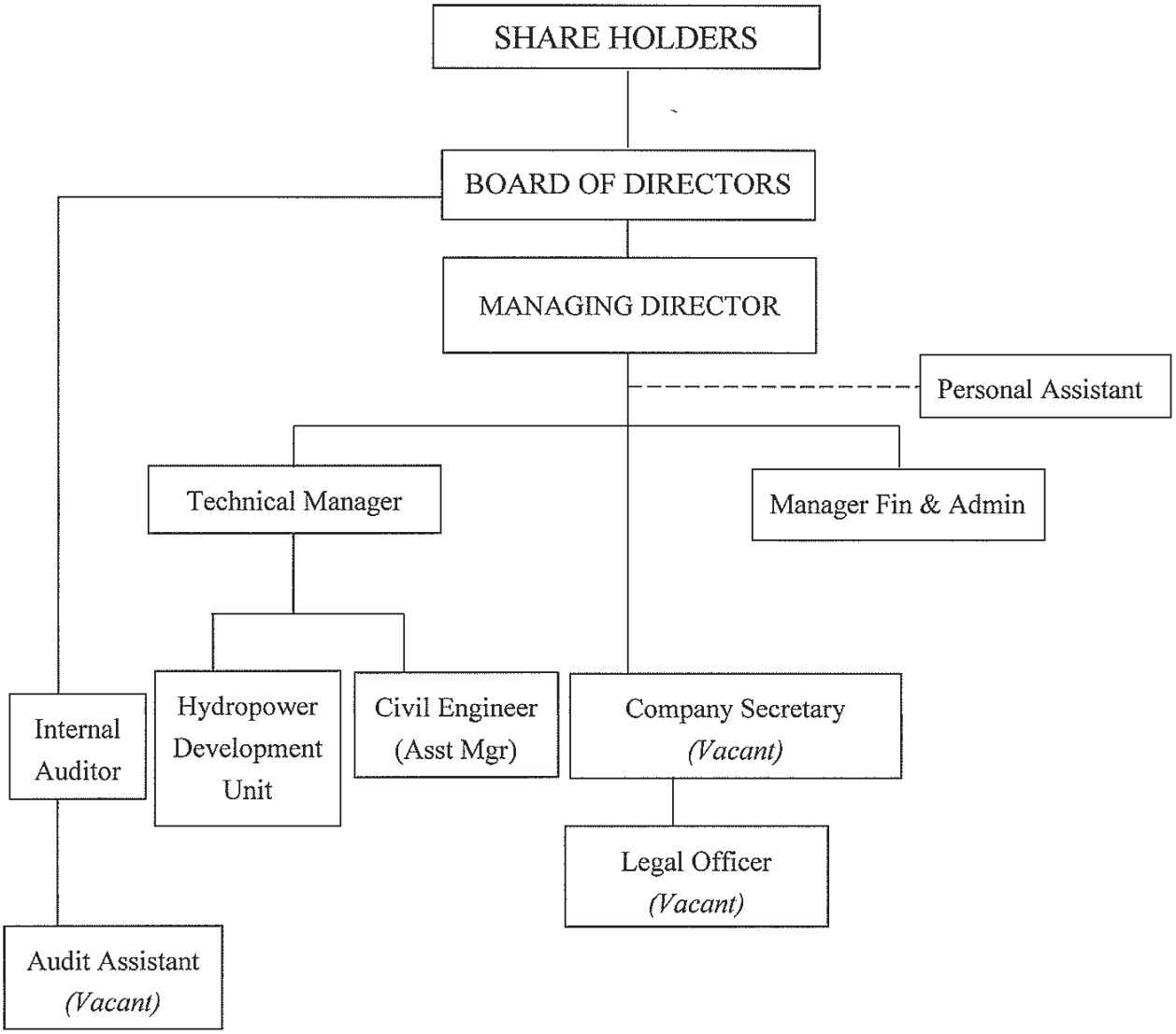
Tentative Schedule



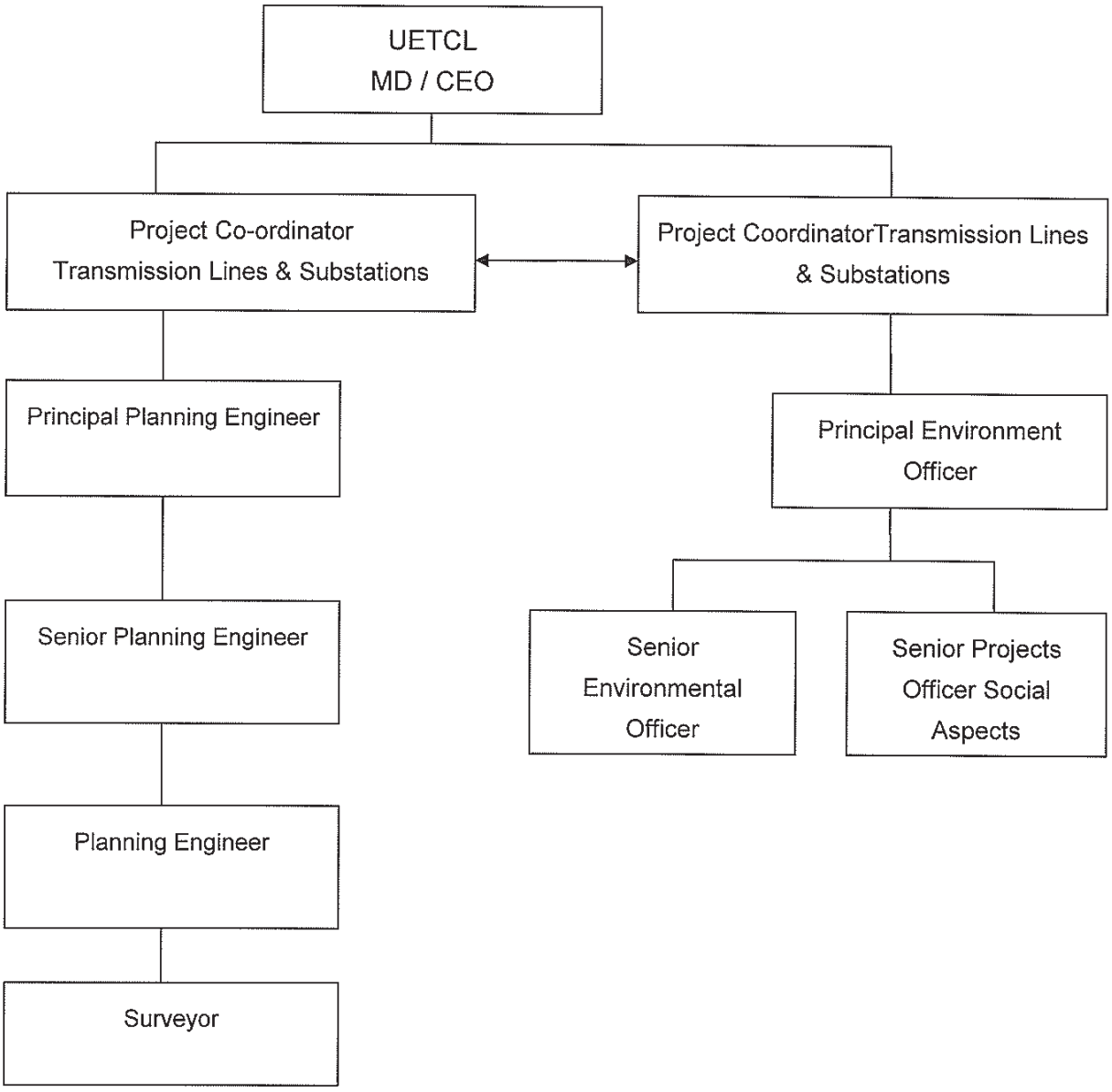
Remarks
: Work in Japan
: Work in Uganda
: Field investigation
Ic/R: Inception Report, It/R: Interim Report, Df/R: Draft Final Report, F/R: Final Report



Organization chart of MEMD



Organization chart of UEGCL



Organization chart of UETCL

Appendix 2

THE MAIN POINTS DISCUSSED

1. Main findings

(1) Environmental and Social Considerations

Ugandan side (UEGCL, UETCL and MEMD) confirmed that the JICA Guidelines for Environmental and Social Considerations (April 2010), hereinafter referred to as the JICA Guidelines, are applied to the Project (Phase I). The Survey Team explained the JICA Guidelines and the UEGCL, UETCL and MEMD agreed to comply with all the laws/regulations related to environmental and social considerations, as well as the requirements of the JICA Guidelines.

The Ugandan side confirmed that UEGCL and UETCL will obtain all the necessary permission for implementing the Project. Both parties recognized that the Project is required to conduct EIA process as it is stipulated by the National Environment Management Authority, NEMA. JICA explained that the Resettlement Action Plan (RAP) will be necessary if the Project causes large scale involuntary resettlement.

As a first step of environmental procedure, the UEGCL and UETCL will submit Project Brief for the Study to NEMA in order to receive approval before commencement of the field investigation, i.e. May, 2012.

(2) Counterpart organization

Both sides agreed that UEGCL would be the main counterpart organization of the Preparatory Survey (F/S) and UETCL would also be a counterpart organization especially in the field of transmission line matters. MEMD is to be supervising organization.

UEGCL UETCL and MEMD agreed to submit lists of counterpart personnel to JICA Uganda office before JICA dispatches the Preparatory Survey (F/S) team to Uganda.

(3) Steering Committee

Both sides agreed to form a steering committee to facilitate smooth implementation of the Preparatory Survey (F/S) by ensuring timely information exchange with other relevant sectors.

In order to implement environmental study in the Preparatory Survey (F/S), both parties agreed that the steering committee will receive technical advice from an environmental advisory group which should be constituted by environmental experts from the academia as well as recognized local and international environment conservation agencies.

Structure of steering committee and environmental advisory group is shown in Annex 1. Ugandan side mentioned that members of steering committee and environmental advisory group will be considered by the Ugandan side and the list of members will be submitted to JICA Uganda Office before commencement of the Preparatory Survey (F/S).

(4) Stakeholder Meetings

UEGCL will be responsible for organizing and conducting stakeholder meetings in the course of the Preparatory Survey (F/S) aimed at discussing findings of the Preparatory Survey (F/S) and contributing to consensus building.

(5) Development of the Project in the Murchison Falls National Park

Ugandan side explained that development of the Project is treated as any other economic activities under Section 18 (5) (e) and it is categorized as an unlawful activity that requires authorization under Section 24 of the Uganda Wildlife Act (Cap 200) 1996. Therefore, for the implantation of Ayago Hydropower Project within Murchison Falls National Park, it is necessary that EIA is conducted and permission by the Executive of UWA (Uganda Wildlife Authority) should be issued. Eventually the EIA shall be approved by NEMA.

Examples of activities permitted by UWA within national parks recently are listed as below.

Name of National Park	Project Title	Proponent	Approval of EIA
Murchison Falls National Park	Karuma Interconnection Project (Karuma-Olwiyo 132kV Transmission Line)	UETCL	2011
Murchison Falls National Park	The Infill Seismic Survey	Heritage Oil & Gas (U) Ltd.	2010
Murchison Falls National Park	The Exploration drilling activities	Heritage Oil & Gas (U) Ltd.	2010
Queen Elizabeth National Park	Mbarara-Nkenda 132kV Transmission Line	UETCL	2009
Murchison Falls National Part	Construction of Chobe Safari Lodge	Chobe Safari Lodge Ltd.	2008
Murchison Falls National Part	Communication Mast	Celtel Uganda Ltd.	2007

(6) Consideration of Downstream and Neighboring Countries International Watercourses

Both sides agreed that necessary procedures such as notice of commencement of the F/S to National River Basin (NBI) and explanation and information sharing regarding the development of the Project to Nile Basin Initiatives and the related counties are to be undertaken appropriately by the Ugandan side.

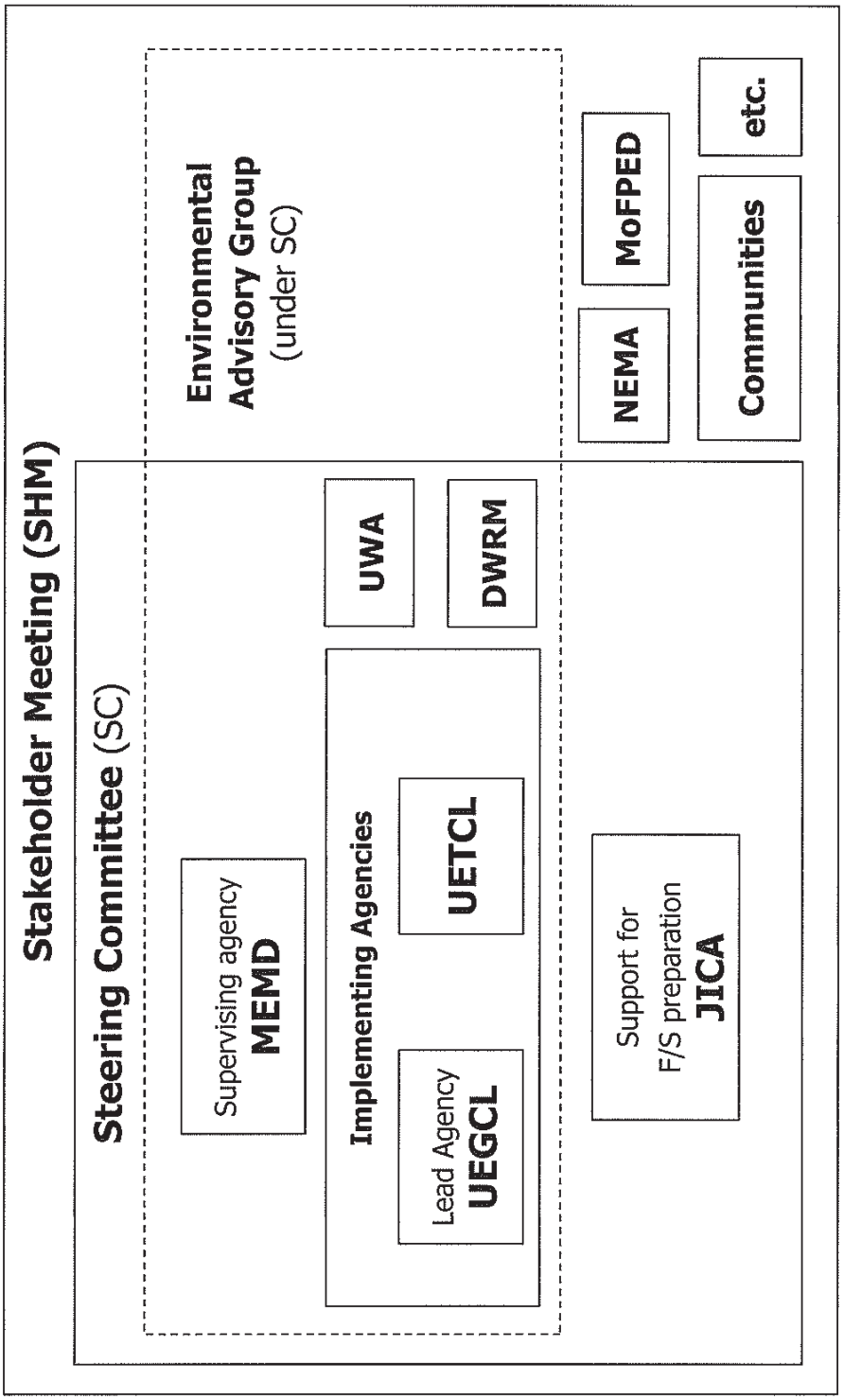
(7) Provision of Office Space and Telephone

UEGCL will provide office space for the Preparatory Survey (F/S) Team. UEGCL will facilitate connection of telephone line and internet for the Preparatory Survey (F/S) Team.

(8) Provision of Security Information on Potential Sites

UEGCL will provide security information on potential sites targeted for reconnaissance survey as necessary.

Annex 1


Stakeholder Meeting (SHM)
Steering Committee (SC)
Supervising agency
MEMD
Implementing Agencies
Lead Agency
UEGCL
UETCL
UWA
DWRM
Support for
F/S preparation
JICA
Environmental
Advisory Group
(under SC)
NEMA
MoFPED
Communities
etc.

Appendix 3

ATTENDANCE LIST

Ministry of Finance, Planning and Economic Development (MoFPED)

Mr. Lawrence K Kiiza	Director Economic Affairs
Mr. Tomohito Kanaizuka	ODA Loan Advisor, Aid Liaison Department

Ministry of Energy and Mineral Development (MEMD)

Eng. Paul Mubiru	Director, Energy and Mineral Development
Mr. James Baanabe Isingoma	Acting Commissioner, Energy Resources Department
Ms. Cecilia Menya	Principal Energy Officer
Mr. Julius Wamala	Senior Energy Officer
Mr. Emmanuel Sande Nsubuga	Energy Officer (Electrical)
Ms. Molly Mbekeka	Electrical Engineer

Uganda Electricity Generation Company Ltd. (UEGCL)

Mr. John E. Mugyenzi	Managing Director
Mr. Emmanuel Lubandi	Manager, Finance & Administration
Mr. Dan Mayanja	Technical Manager
Mr.Moses Kaizzi	Assistant Technical Manager
Mr. Omona Jimmy	Hydraulic Engineer, HPDU
Mr. Kitayimbwa Godfrey	Electrical Engineering Specialist, HPDU
Mr. Otim Moses	Environmental Specialist, HPDU
Mr.Kanzira M.	Procurement Specialist, HPDU
Mr.Mukulu Musa	Electrical Engineer

Uganda Electricity Transmission Company Ltd. (UETCL)

Mr. EriasiKiyemba	Managing Director/CEO
Mr. Dennis Makuba	Manager, Projects Implementation
Mr. Nasser Kasendwa	Ag. Manager, Planning & Investments
Mr. Daniel Emmanuel Okello	Planning Engineer
Mr. MarkNamungo	Planning Engineer
Mr. Grace Nyapendi	Projects Engineer
Mr. John Othieno	Principal Environmental Officer

Mr. Joseph Jones Ogwal	Senior Environmental Officer
Mr. Andrew Omalla	Technical Officer, Projects
Mr. Muwamli Erisa K	Surveyor

Uganda Wildlife Authority (UWA)

Mr. Kapere Richard	Senior Planning & EIA Officer
Mr. Tim Okello	Murchison Falls N. P., Conservation Area Manager

Japan International Cooperation Agency (JICA)

Mr. Tetsuo Seki	Chief Representative, JICA Uganda
Ms. Akiko Nanami	Representative, JICA Uganda
Ms. Masae Iijima	Project Formulation Advisor, JICA Uganda
Mr. Daniel Rutabingwa	Consultant, JICA Uganda
Mr. Muname Ivan	Program Officer, JICA Uganda
Mr. Teruyuki Ito	Director, Electric Power Division, JICA HQ
Mr. Yoshikazu Wada	Deputy Director, Electric Power Division, JICA HQ
Mr. Shusaku Kawai	Country Officer, Africa Division 2, JICA HQ
Dr. Kazumoto Onodera	Consultant, Electric Power Development Co., Ltd.
Mr. Nobuyuki Nakazawa	Consultant, Sowa Consultant Inc.

ATTENDANCE LIST

(Stakeholder Meeting held on 18th October, 2011, MEMD)

Name	Organization	Position Title
Eng. Paul Mubiru	MEMD	Director, Energy and Mineral Development
Mr. James Baanabe Isingoma	MEMD	Acting Commissioner, Energy Resources Department
Mr. Sajjabi Fred	MEMD	Senior Energy Officer
Mr. Emmanuel Sande Nsubuga	MEMD	Energy Officer (Electrical)
Mr. John E. Mugyenzi	UEGCL	Managing Director
Mr. Omona Jimmy	UEGCL	Hydraulic Engineer, HPDU
Mr. Otim Moses	UEGCL	Environmental Specialist, HPDU
Mr. Dan W. Mayanja	UEGCL	Technical Manager
Mr. Andrew Geno Omalla	UETCL	Technical Officer, Projects
Mr. Joseph Jones Ogwal	UETCL	Senior Environmental Officer
Mr. Mbaga Juzinde	ERA	Economist, Electricity Regulatory Authority (ERA)
Mr. Harold Obiga	ERA	Legal Officer
Mr. Kagaba Paul M.	ERA	Projects Engineer
Mr. Jan Broekheis	WCS	Director, Wildlife Conservation Society (WCS)
Ms. Carol Bogezi	WCS	Field Coordinator
Mr. Job Mutyaba	WWF	Renewable Energy Officer, World Wildlife Fund for Nature (WWF)
Mr. Eriabu Lugujjo	Makerere Univ.	Representative Principal, College of Engineering, Design, Art and Technology
Ms. Mary Suzan Abbo	Makerere Univ.	Head of Pico-Hydro, Center for Reserch in Energy and Energy Conservation
Mr. Kiwanuka Achilleo	UNDF	National Programme Officer, Uganda Nile Discourse Forum (UNDF)
Ms. Dianah N. Wabwire	Nature Uganda	Research Coordinator
Mr. Teruyuki Ito	JICA	Director, Electric Power Division, JICA HQ
Mr. Yoshikazu Wada	JICA	Deputy Director, Electric Power Division, JICA HQ
Mr. Shusaku Kawai	JICA	Country Officer, Africa Division 2, JICA HQ
Dr. Kazumoto Onodera	JICA	Consultant, Electric Power Development Co., Ltd.
Mr. Nobuyuki Nakazawa	JICA	Consultant, Sowa Consultant Inc.
Ms. Akiko Nanami	JICA	Representative, JICA Uganda
Ms. Masae Iijima	JICA	Project Formulation Advisor, JICA Uganda
Mr. Daniel Rutabingwa	JICA	Consultant, JICA Uganda
Mr. Muhame Ivan	JICA	Program Officer, JICA Uganda

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アヤゴ水力発電所開発計画策定プロジェクト
開発計画調査型技術協力

MINISTRY OF ENERGY AND MINERAL DEVELOPMENT

FULL FEASIBILITY STUDY FOR AYAGO HYDROPOWER SITE

JULY 2010

APPLICATION FORM FOR JAPAN'S DEVELOPMENT STUDY PROGRAMM

1. Date of entry: July 2010

2. Applicant: The Government of Uganda

3. Project Title: Feasibility study, Technical Design for the Ayago – Nile Hydropower Project

4. Implementing Agency: Ministry of Energy and Mineral Development, P.O. Box 7270, Amber House, Plot 29/33, Kampala Road, Kampala

Contact Person:	The Permanent Secretary
Tel. No.:	+ 256 414 234 733
Fax:	+ 256 414 230 220 / 234 732/ 349 342
Email:	psmemd@energy.go.ug

5. Background of the Project

5.1 Current conditions of the sector:

Uganda is facing significant constraints to continued rapid economic recovery due to the lack of electrical power. Presently an estimated 16% of Uganda's population is supplied with grid electricity, and 70% of these customers reside in the three major towns of Kampala, Entebbe and Jinja. Approximately 30% of the Country's urban population is connected to the grid. Peak demand presently stands at about 450 MW and there is signifincant suppressed demand. Currently the total number of consumers connected to the national grid is about 400,000.

One of Uganda's strategic policy is to shift investments from urban areas so as to introduce socio – economic growth and induce poverty reduction in the rural areas. The Ministry of Energy and Mineral Development has carried out several grid extensions to rural areas and

coupled with the rehabilitation and refurbishment of the network in both rural and peri – urban areas.

Fast growing demand standing presently at 8% per annum, combined with lack of timely investment in the electricity sector led to load shedding that is not only unpopular with domestic consumers but also very disruptive to socio-economic growth of the country. Large parts of the country (country side, small towns and parts of urban centers) that are not connected to the power supply suffer from lack of opportunities to develop new trades that are possible only with availability of reliable supply of electricity. This has forced government to bring in expensive thermal power plants to bridge the gap.

Alternatives to subsistence agriculture such as industrialization and commercialization of agriculture (by mechanization, agro-processing, preservation etc) cannot be developed without access to power supply.

5.2 Sectoral development policy of the national / local government.

The Ministry of Energy and Mineral Development (MEMD) is the lead agency responsible for the management of the energy sector through coordinated national policy formulation, implementation and monitoring as well as the promotion of the development of the sector. In that regard, Ministry facilitates the mobilization of resources into strategic areas for energy development. Presently a 250 MW hydro power plant is being constructed at Bujagali by an Independent Power Producer – Bujagali Energy Limited (BEL), while the Karuma Hydro Power Project is soon going out for a Construction tender as a public private partnership investment project. Expensive thermal power plants totaling 170 MW helped to stabilize the supply of power. The challenge has been the high subsidy level required to make the electricity tariff affordable to the consumers. These thermal power plants therefore need to be replaced with cheaper options. The mission of the Ministry is to create conditions for the provision of safe, reliable, efficient, cost effective and environmentally appropriate energy services to all sectors on a sustainable basis and thereby contribute to the economic growth of the country. Some of the key policy objectives are:

- To increase the energy mix in power generation, promote and co-invest in the development of new power generation and transmission projects
- To acquire and provide necessary information and data to attract and facilitate private sector participation and capital inflow
- To promote and implement rural electrification through grid extension, development of decentralized power supply systems and use of renewable energy resources

The government's Poverty Reduction Strategy considers an expansion of facilities for irrigated farming and processing of agriculture production near the production centers as important elements of the strategy for rural development and poverty reduction. However, these cannot be achieved if present acute shortage of electric power is not stopped. In view of the above and in order to reverse the bad energy situation in the country, Government of Uganda intends to accelerate the development of the potential of the Ayago site and is making this request to the Government of Japan for the formulation of a master plan for the Feasibility Study and construction of the Ayago Hydro Power Project.

5.3 Problems to be solved in the sector

- Low Generation Capacity
- Low power supply locally and regionally
- Low electricity access levels
- Meeting the fast growing electricity demand

5.4 Project's priority in the National Development Plan/Public Investment Program:

The electricity peak demand in the country is growing at a rate of 8% per annum. Besides the immediate and short term measures like the emergency thermal generation which are being implemented, in the medium term, it is expected that the electricity demand will be

met by an assemblage of the Kiira Power Plant operating as a base load with Nalubaale operating as a peaking plant and the 250 MW Bujagali project that is nearing commission. Demand will however soon outgrow the capacity of these plants hence the need for accelerated addition of cheap and reliable generation capacity.

In the National Development Plan (2010/11 – 2014/15) the development of the following projects is planned: completion of Bujagali (250MW), construction of Karuma (700 MW) & Ayago (700 MW), development of Oriang (400MW), Isimba (130MW) Heavy Fuel Oil at Mputa (700 MW), Solar thermal plants (200MW), Geo-thermal plants (100MW), co-generation capacity (150MW) and small renewable energy projects (150 MW).

The Ayago Project being one of the high priority projects in the Hydro Power Development Master Plan and consequently in the National Development Plan, is presently nearing completion of the Pre-feasibility study phase and this Application if granted will enable the progressing of the Ayago project to the next phase of Full Feasibility level with preliminary Technical Designs then BoQs, Tender Documents for Construction and financing mobilization in a subsequent phase.

6. Outline of the Ayago Project:

6.1 Overall Goal (Long – term objective) of the Project:

As a run of a river project with multiple tunnels, the Ayago Development can be constructed in stages i.e. by adding one tunnel at a time as demand grows. The bulk of the supply from the Ayago Plant will be delivered to the most power intensive load centers of Kampala, Jinja and Entebbe. However because of its location within the supply system the Plant will in addition to supplying the project area contribute to the power supply in the Northern, Central and Western parts of the country and in the short term supply surplus power to Southern Sudan and the East African Region. The project will primarily serve the fast growing National energy demand with emphasis on the country's rural areas for delivery of socio services and for economic activities leading to poverty alleviation. Construction of new inter

– connection lines to Kenya, Sudan and Tanzania is planned and when completed will strengthen the regional power system enabling free flow and sale of power.

6.2 Project purpose

The purpose of the request is for Japan government to enable JICA to carry out a Full Feasibility study and prepare preliminary Technical Designs of the Ayago Project in this Phase and then in a subsequent Phase to develop the project Bills of Quantities, Tender Documents for Construction and assist the Government of Uganda to mobilize co-financing for the construction of the Ayago Hydro Power Project as the next highest ranked Project after Karuma project in the Hydro Power Development Master Plan and in line with the 5-year National Development Plan for Uganda 2010/11 – 2014/15.

6.3 Outputs:

Main outputs of the study will include but not limited to Detailed Feasibility Study and Technical Design of the Project with detailed analysis and evaluation of the financial, economic as well as environmental and socio – economic impacts assessment, establishment of Bills of Quantities for the best layout /selected option and related cost estimates, establishment of sources and quantities of construction materials, establishment of construction schedule and other logistics.

In addition to the above the following outputs will be achieved:

(i) A study of the transmission line and interconnection points to the National/regional grid for the Ayago Project.

(ii) Establishment and recommendations to the client on the role/contribution/operation of the Ayago to long term regional energy supply and stability.

(iii) Establishing sources of funding and helping GoU in mobilizing funding arrangements and achieve financial closure for the implementation of the project.

6.4 Area to be covered by the Project

The project is located on the Nile river about 60 km upstream from Murchison Falls at a point where the Ayago, a tributary of river Nile joins the Nile river. Between Karuma and Murchison a distance of about 90 km, the Nile river passes over a series of rapids and Falls, giving a total drop of 400 m. The distances from some major towns are as follows:

- Gulu (North) 95 km
- Masindi (South) 175 km
- Kampala (South) 320 km
- Lira (East) 140 km
- Arua (North West) 215 km
- Hoima (South) and

  the oil rich Albertine Graben …..km

6.5 Project Activities

The main project activities for this Phase will include

- Collection of additional basic data and examination and research of pre feasibility study activities and other relevant information.
- Site investigations(topographical, hydrological and geo technical surveys)
- Hydro power project optimization
- Designs
- Environmental survey and studies
- Project cost Estimates

6.5.1 Basic Research and data collection.

The consultant shall review the Pre Feasibility study report and other relevant documents and collect additional data and information required for detailed feasibility study. Layout options established during the Pre feasibility studies will be analysed using technical, economic, socio economic, environmental and other criteria and the best evaluated layout development option will be selected and used for the detailed design of the various project major structures such as intake, waterways, power house tail race addicts and the switchyard as well as design of the electro mechanical plant. Transmission line route to evacuate the power generated to the National grid shall be carried out.

6.5.2 Site Investigations

(i) Topography Survey

Detailed topographic survey and mapping of relevant project areas to appropriate scales (1:1000 for the various civil structure positions and 1:10,000 for reservoir, T-Line and other structures) to enable detailed preliminary design of these structures and establishment of bills of quantities, reservoir area and volume, project affected persons if any, construction materials and waste/rubble damping area and location etc. shall be carried out by the Consultant.

(ii) Hydrological Study

A key aspect of the study in determining the plant capacity and operating characteristics will be the establishment of the long term hydrology. The Consultant shall collect additional hydrological and meteorological data from various data stations and departments and perform the necessary analysis to determine project design flows, floods and flood control requirements, operating regimes, water quality and management of amenity flows.

(iii) Geo – technical study

The Consultant shall carry out all the necessary geotechnical investigations required by the project including geological mapping, core drilling, laboratory and field in situ testing, delineation of rock outcrops and seismic surveys studies to establish the sub-surface ground conditions for the civil structures and appurtenances as well as establishment of quality and location of construction materials. The consultant shall establish geological and seismic risks associated with the project by carrying out seismological and geo technical studies and develop appropriate project design. Arising out of the geo- technical studies the consultant shall also make recommendations on risk allocation between the client and the contactor.

6.5.3 Environment Impact Assessment Study (EIAS)

The Environment Impact Assessment Study (EIAS) shall include but not necessarily be limited to the following items:

- Inventory of land use, existing settlements and ownership in the affected project and area.
- Evaluation of land property
- Identification of resettlement requirements and resettlement areas (if any).
- Flora species
- Fauna – wild life, population and migration pattern, feeding and breeding habits
- Fisheries
- Archeology
- Aquatic weed situation
- Water quality
- Vegetation clearance of the reservoir area

- Impact of landscape of reservoir, dam, power station, transmission lines, access roads and borrow areas, restoration of borrow areas
- Soil erosion
- Waste management – soil and excavated rock disposal / utilization
- Aesthetics

The environmental study shall also include a proposal for future watershed management policies, a continuous monitoring program for the project and reservoir area as well as the resettlement area (if any). A recommendation of an authority to be responsible for the monitoring program shall also be made.

In the evaluation of different technical options of the different project features environmental risks and costs shall be considered. Mitigation measures to reduce impact on environment shall be proposed. The economic evaluation of the environmental impact shall be an integrated part of the technical and economical optimization process in the feasibility study.

6.5.4 System Study

A review of the 2007 – 2022 grid development plan will be carried out with special emphasis on the load forecast, long terms demand and supply balance and grid extension program. This will be used in the establishment of the design and installed capacity of the Ayago Project. A full recommendation shall be made on the system study.

6.5.5 Optimization and Sensitivity Analysis

The consultant shall carry out Optimization and financial and technical sensitivity analysis of the project and come up with recommendation on best options to implement and their IRR and NPV.

Estimates of power production from the selected project shall be carried out based on a hydrological model and the optimization discharge.

6.5.6 Feasibility Design

The consultant shall carry out the project feasibility design to conform to best engineering international standards and practice and shall ensure that the following major components of the project are suitably selected and optimized minimizing hydraulic losses and maximizing technical efficiency.

- Intake dam and weir
- Reservoir (size and volume if necessary), head water operating and draw down levels
- Water conveyance passages
- Power house (underground)
- Tail water addicts and levels
- Governing and control system
- Switchyard and Transmission line connection to load centers
- Electro-mechanical plant and equipment

The Consultant shall optimize installed capacity and annual energy production levels for the project.

6.5.7 Cost Estimates

Project cost estimates shall be prepared to include the costs of civil works, electro-mechanical equipment, power distribution system, access roads, resettlement (if any) and environmental costs, engineering and administration, etc. The estimates should take into consideration future use of or construction camps for tourism

facilities. Costs for labour, materials and equipment shall be estimated in two parts, one for local and the other for foreign currency.

Estimated quantities of civil works together with unit rates shall be specified in bills of quantities. Indirect costs for civil contractor's general arrangements, mobilization, etc., should be given separately and not be included in the unit rates.

Contingency rates shall be given separately for civil works, mechanical and electrical works as well as for engineering and administration shall also be given. Interest during construction shall be calculated separately.

6.6 Input from the Recipient Government

Counterpart staff

- The Hydropower Development Unit (5)-
  - Civil Engineer
  - Electrical Engineer
  - Mechanical Engineer
  - Economist
  - Environmentalist
- Electrical Power Division (2) – Electrical Engineers
- Transmission Company – System and Transmission Engineer

6.7 Inputs from Japanese Government

- Cost of the study

- Study Team (Consultants for the study)

- Study Equipment and Technology

7 Implementation schedule

Expected duration of study is 12-15 months starting immediately after completion of the on going Pre Feasibility Studies. The client however expects that on timely approval of this request, the consultant can carry out overlap some aspects of the Full Feasibility Study in order to shorten the study period. (Schedule is attached as appendix 1)

8 Description of Implementing Agency

The Ministry of Energy and Mineral Development (MEMD) is a government Agency responsible for the sector policy formulation and development planning. It is responsible for resource mobilization and overseeing the implementation of energy related projects. (Organizational chart is attached as appendix 2)

Number of staff of the Agency: 170 (Technical) 175 (support)

9 Related Information

9.1 Possibility to be implemented / Expected funding resources:

After the study, the project is expected to be implemented using Japanese loan, other multilateral lending agencies and own funding from the Uganda government and will be implemented either as a full public investment or public private partnership.

9.2 Other relevant projects (activities in the sector by the recipient government:

9.2.1 Procurement of Additional Thermal Generation Capacity:

Government procured additional 100 MW of thermal power. 50 MW high speed diesel plant was installed at Mutundwe using an IDA credit while the other 50 MW Heavy Fuel Oil (HFO) plant by a Norwegian firm on Build Own Operate and Transfer (BOOT) basis was installed at Namanve in the Industrial Park.

Thermal generation has a very high cost due to escalating petroleum prices. Since the consumer subsidy which government has injected into the programme for the last one year is not sustainable, there is need to review the tariff policy to reflect the economic cost of power supply.

9.2.2 Renewable Energy Generation projects:

Several renewable energy projects including small hydros, cogeneration in sugar mills and biomass – gasification plants are being developed as public private partnerships to generate at least 50 MW for the grid. These projects are estimated to cost USD 108 million, USD 65 million being from the private sector and USD 43 million from the public resources (GoU / World Bank Credit).

9.2.3 The Bujagali Hydro Electric Project (250MW):

The project was repackaged to be developed by a Consortium with IPS as the lead developer. Construction of Bujagali project started in early 2008 ans is expected to be commissioned in 2011/12.

9.2.4 The Karuma Hydro Electric Project (700MW):

Government after facing serious delays in the implementation of the Karuma Project by Norpak is going ahead with plans to develop the Karuma project as a public-private-partnership Project with substantial financing from the Government. The feasibility study phase for the Karuma project has started and will go on till February 2011. Construction is targeted to commence mid 2011 with expected commissioning date in 2014/15

9.4 Other relevant information (available data, information, documents, maps related to the project):

i. Available data, information, documents, maps, etc. related to the study

- Ayago – Nile Hydroelectric Project pre-Feasibility Study being carried out with support from Jica
- Hydrological data
- Demand Forecast
- Hydropower Development Power Master Plan
- East African Power Master Plan Study

10 Global Issues (Gender, Poverty, Climate change, etc)

10.1 Poverty

Limited access and use of energy significantly slows down economic and social-transformation. The low energy consumption per capita in Uganda has contributed to the slow economic transformation by limiting industrialization as well as value addition. Industrialization has a direct impact in alleviating poverty by providing employment to Ugandans who can then improve their standards of living.

Within the project area, the standard of living in the project areas is low with most practicing subsistence agriculture and trading a limited amount of items at local markets. There are inadequate health facilities, a lack of proper school buildings and teachers, and poor infrastructure. In addition, fuel wood and safe sources of drinking water are in short supply.

Development of the project will come with employment opportunities for non – skilled workers, a market for local produce, and increase in business opportunities for non – skilled workers, a market for local produce, and increase in business opportunities for a few with ready capital and improved infrastructure and social services.

10.2 Climate change

Energy exploitation pattern is such that biomass accounts for 92 per cent of total energy consumed while fossil fuels account for 7 per cent and electricity accounts for only 1 per cent. Most of the biomass energy is from wood, which is consumed in the form of charcoal and firewood. This exploitation pattern has led to the degradation of the forest cover in the country and contributing to climate change.

10.3 Millennium Development Goals

11 Environmental and Social considerations (filled the screening format attached)

12 Beneficiaries

The project will benefit the whole country not necessarily targeting women.

13 Security conditions

The development will be taking place in the districts of Masindi and Amuru which have no insecurity.

Signed: ……

Title: ……

On behalf of the Government of Uganda

Date:……..

SCREENING FORMAT

Screening Format

Question 1 Outline of the Project

1-1 Does the project come under the following sectors?

√Yes □No

If yes, please mark corresponding items.

□Mining development

□Industrial development

□Thermal power (including geothermal power)

Hydropower, dams and reservoirs

□River / erosion control

Power transmission / distribution lines

□Roads, railways and bridges

□Airports

□Posts and harbors

Water supply, sewerage and waste treatment

□Waste management and disposal

□Agriculture involving large – scale land clearing or irrigation

Forestry

□Fishery

Tourism

1-2 Does the project include the following items?

√Yes □No

If yes, please mark the following items:

□Involuntary resettlement (Scale: household persons)

□Ground water pumping (Scale: m^3/year)

□Land reclamation, land development and land – clearing (Scale: hectares)

□Logging

1-3 Did the proponent consider alternatives before request?

√Yes: Please describe outline of the alternatives

(Considered the available alternative sources of generating electricity)

□No

1-4 Did the proponent have meetings with the related stakeholders before request?

√Yes □No

If yes, please mark the corresponding stakeholders

√Administrative body

√Local residents

√NGO

Others

Question 2

Is the project a new or an on – going one, have you received strong complaints etc. from local residents?

□New □on – going(there are complaints) √on – going(there are no complaints)

□Others

Question 3: Name of the law or guidelines:

Is environmental Impact Assessment (EIA) including Initial Environmental Examination (IEE) required for the project according to a law or guidelines in the host country?

√Yes □No

□ Required only IEE (□implemented, □ongoing, □planning)

√ Required both IEE and EIA (□implemented, √ongoing, □planning)

□required only EIA (□implemented, □ongoing, □planning)

□Others:

Question 4

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

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

(Date of approval: Competent authority:)

√Not yet started an appraisal process)

Others:

Question 5

If a certificate regarding the environment and society other than EIA is required, please indicate the title of the certificate.

□Already certified Required a certificate but not yet done

Title of the certificate :( )

□Not required

□Others

Question 6

Are the following areas located inside or around the project site?

√Yes □No □Not identified

If yes, please mark corresponding items

National Parks, protected areas designated by the government (coast line, wetlands, reserved area for ethnic or indigenous people, cultural heritage) and areas being considered for National Parks or protected areas.

Virgin forests, tropical forests

Ecological important habitat areas (coral reef, mangrove wetland, tidal flats)

Habitat of valuable species protected by domestic laws or international treaties

Likely salts cumulus or soil erosion areas of massive scale

Living areas of ethnic, indigenous people or nomads who have a traditional lifestyle, or special socially valuable area

Question 7

Does the project have adverse impacts on the environment and local communities?

√Yes □No □Not identified

Question 8

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

□Air pollution

□Water pollution

□Soil pollution

□Waste

□Noise and vibration

□Ground subsidence

□Offensive odors

□Geographical features

□Bottom sediment

□Biota and ecosystem

□Water usage

Outline of related impacts:

The project creates opportunities for jobs to the local communities. It also utilizes the available natural resources including water and the falls. It is a cleaner option compared to the alternatives that would emit green house gases that would lead to Global warming.

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

√Existing social infrastructure and services

□Accidents □The poor indigenous of ethnic people

√Global warming

□Involuntary resettlement □Maldistribution of benefit and damage

√Local economy such as employment

□And livelihood etc. □Local conflict of interests

√Land use and utilization of local

resources √Gender

√Children's rights

√Cultural heritage

√infectious disease such as

HIV/AIDS etc.

□Others

Question 9

Information disclosure and meetings with stakeholders

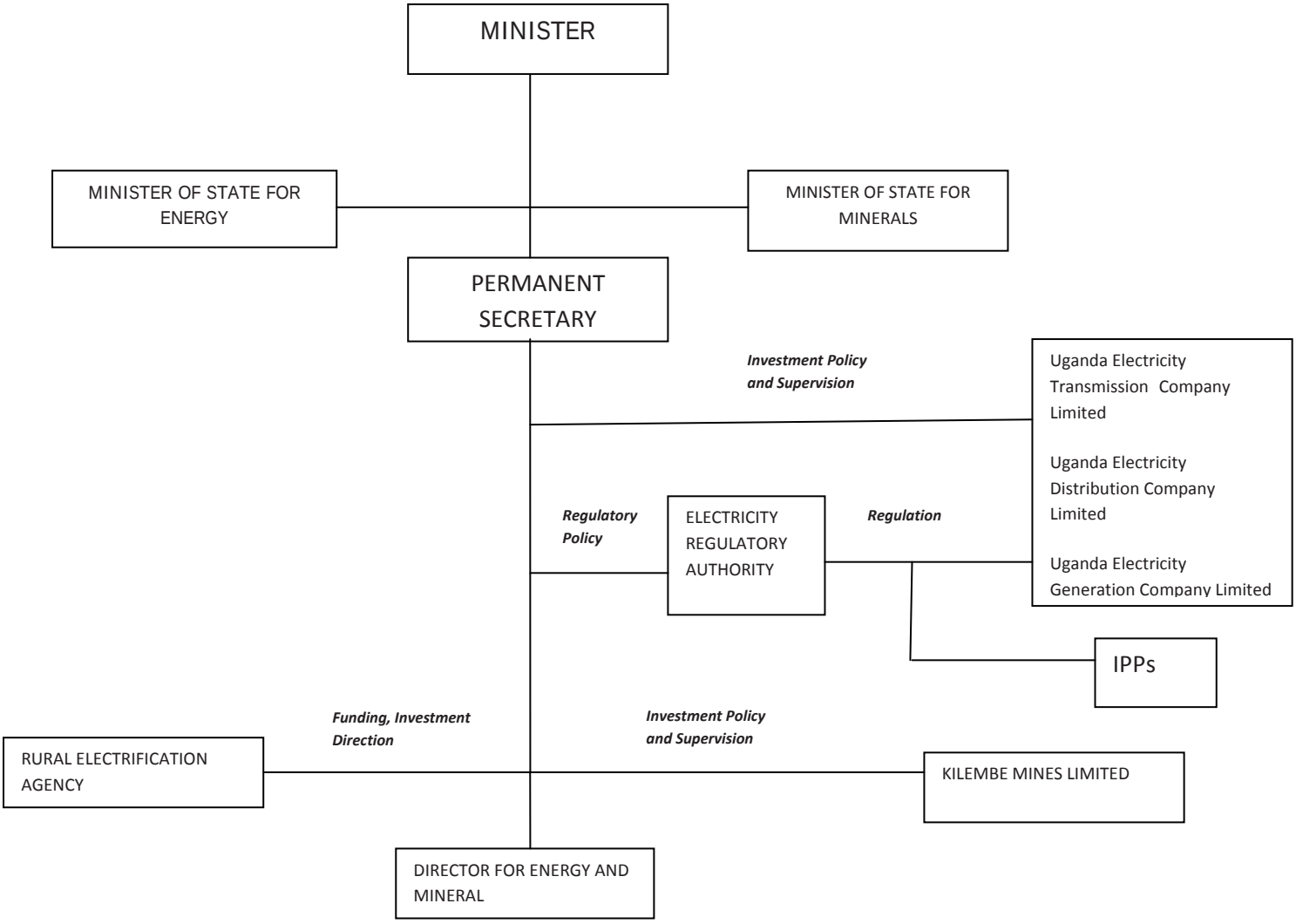
9-1 if the environmental and social considerations are required, does the proponent agree on information disclosure and meetings with stakeholders in accordance with JICA guidelines for environmental and social considerations?

√Yes □No

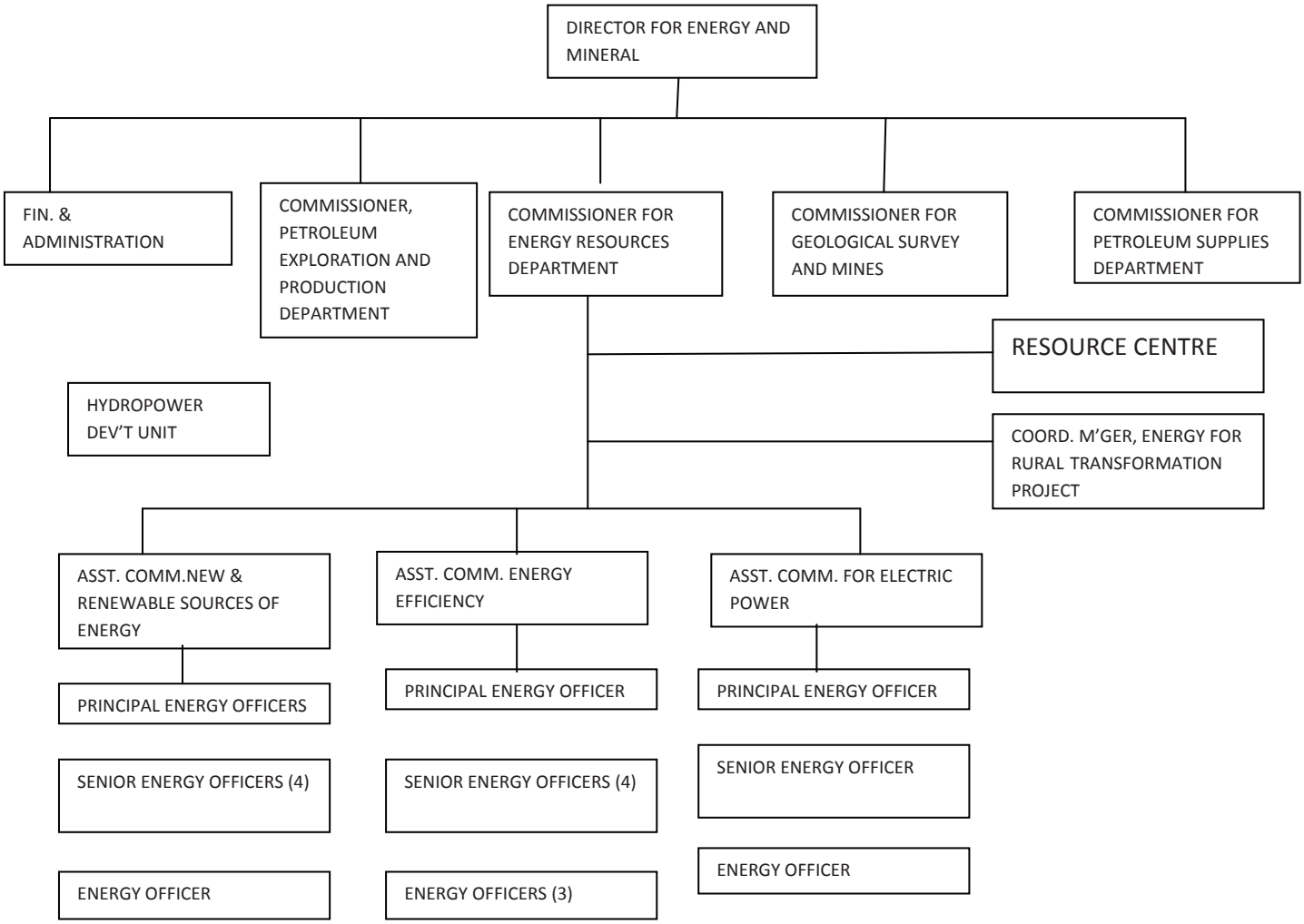
9-2 if no, please describe reasons below.

Annex 1 Study Implementation Schedule

Appendix 2: Ministry Organization Chart - I



Appendix 3: Ministry Organization Chart - II



QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Ministry of Energy and Mineral Development

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project and environmental section

(2) Please provide the list of responsible person in charge of this JICA project and the staffs

2. Hydropower and Energy Planning

(1) Please provide the latest Grid Development Plan if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

(2) Please provide the latest The Development of a Power Sector Investment Plan for UGANDA if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

(3) Please provide the latest National Development Plan if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

(4) Please provide the latest Vision 2035 if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

(5) Please provide the budget information including Energy Fund for Hydropower Project in the Republic

of Uganda

(6) Please provide financial plan of Ayago Hydropower Project in the Republic of Uganda

(7) Please provide the Project Purpose of Ayago Hydropower Project as Government of Uganda.

3. Laws and Regulations

Please provide the following information, if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

(1) Rights to the use of water for Hydropower

(2) Permissions and conditions to conduct the seismic prospecting at Ayago Site

(3) Environmental Standards and Regulations

- Water Quality Standard and Effluent Standard for River and Lake
- Air Quality Standard and Emission Gas Control Standard
- Environmental Quality Standards for Noise & Vibration
- Laws and Regulations for Industrial Waste Management
- Laws and Regulations for Soil Contamination

(4) Natural Environment Conservation

- Conservation of Ecosystem and Biodiversity
- Conservation of Threatened and Endangered Species
- Conservation of National Park and Wildlife
- Conservation of Forest

(5) Social Environment Conservation

-Conservation of Cultural Heritage
- Conservation of Landscape
-Land Acquisition
- Resettlement and/or Relocation
- Conservation of Indigenous and Tribal People
- Water Use including Irrigation and Fishery in River and/or Lake
- Land use

(6) Environmental Assessment System (EIA)

4. Related Governmental Organization

(1) Please provide list of the permissions and the responsible governmental organizations to conduct the environmental field survey in the next project, Feasibility Study (FS) of Ayago Hydroelectric Power Project (HPP) in the area of Murchison Falls National Park and wildlife conservation area

(2) Please provide list of the permissions and the responsible governmental organizations to complete EIA after the FS project

5. Existing Environmental Considerations

(1) Please provide list of existing environmental considerations for the projects including HPP, oilfield, and tourism conducted within the boundary of national park and/or wildlife conservation area

6. Contractor and Consulting firm Information

(1) Please provide the following contractor information to complete the Geological investigation, Topographical survey in the next FS project?

- Geological contractor list including university, laboratory, and private consulting firm, which are competent for literature and field surveys in the field of Core Drilling, Borehole TV observation , Seismic refraction prospecting, Ground mapping, Laboratory Test (including Physical and mechanical test, Construction material and Dissolution test) , Initial stress measurement
- Topographical contractor list including university, and private consulting firm, which are competent for literature and field surveys in the field of Topographic mapping scale 1:1000, River/ land cross-section Survey

(2) Please provide CAD operator list including university, laboratory, and private consulting firm, which has well skills and experiences for drawings of Hydropower project

(3) Please provide the following contractor information to complete the environmental survey in the next FS project

- Environmental contractor list including university, laboratory, NGO, and private consulting firm, which are competent for literature and field surveys in the field of biology, ecology, hydrology, water quality, social economy, and ecotourism

* The result of environmental study conducted in FS will be used to complete Environmental Impact Assessment prepared by MEMD. Therefore, the selection of the contractors must be very important works. Especially, biology and ecology must be key factors to complete EIA.

End

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Uganda Electricity Generation Co.Ltd (UEGCL)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide Responsible person in charge of this JICA project and the staffs

2. Laws and Regulations

(1) Rights to the use of water for Hydropower

(2) Permissions and conditions to conduct the seismic prospecting at Ayago Site

3. Operation and Maintenance (O&M) of Hydropower plants

(1) Guidelines or rules for O&M of hydropower plants (HPP)

(2) Budget for O&M of HPP

(3) Mechanism or system for O&M of HPP by UEGCL

End

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: National Environment Management Authority (NEMA)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide Responsible person in charge of this JICA project and the staffs

2. Laws and Regulations

(1) Please provide Permission for seismic prospecting at Ayago site

(2) Please provide the following information for us, if the following laws and regulations were changed or newly established, since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011

1) Environmental Standards and Regulations

- Water Quality Standard and Effluent Standard for River and Lake
- Air Quality Standard and Emission Gas Control Standard
- Environmental Quality Standards for Noise & Vibration
- Laws and Regulations for Industrial Waste Management
- Laws and Regulations for Soil Contamination

2) Natural Environment Conservation

- Conservation of Ecosystem and Biodiversity
- Conservation of Threatened and Endangered Species
- Conservation of National Park and Wildlife

- Conservation of Forest

3) Social Environment Conservation

-Conservation of Cultural Heritage

- Conservation of Landscape

-Land Acquisition

- Resettlement and/or Relocation

- Conservation of Indigenous and Tribal People

- Water Use including Irrigation and Fishery in River and/or Lake

- Land use

4) Environmental Assessment System (EIA)

3. Indigenous Peoples

IFC Performance StandardsPS7 and World Bank Safeguards Policy OP.4.10 stipulate the indigenous people conservation. Could you advise us of the laws relating to the conservation of the indigenous people and the any information on the indigenous people living around the Ayago HPP site?

4. Related Governmental Organization

(1) Please provide list of the permissions and the responsible governmental organizations to conduct the environmental field survey of the next project, Feasibility Study (FS) of Ayago Hydroelectric Power Project (HPP) in the area of Murchison Falls National Park and wildlife conservation area

(2) Please provide list of the permissions and the responsible governmental organizations to complete EIA after the FS project

5. Existing Environmental Considerations

Please provide list of existing environmental considerations for the projects including HPP, oilfield, and tourism conducted within the boundary of national park and/or wildlife conservation area

6. Contractor Information

Please provide the following contractor information to complete the environmental survey in the next FS project.

- Environmental contractor list including university, laboratory, NGO, and private consulting firm, which are competent for literature and field surveys in the field of biology, ecology, hydrology, water quality, social economy, and ecotourism

7. Transmission Line And Tower and Access Road

Please provide your recommendations on environmental and social considerations for the construction of transmission line and tower and access road in the national park and wildlife conservation

End

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Uganda Wildlife Authority (UWA)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide responsible person in charge of this JICA project and the staffs

2. Permission

(1) Please provide list of the permissions and the conditions to conduct the seismic prospecting of the next project, Feasibility Study (FS) of Ayago Hydroelectric Power Project (HPP) in the area of Murchison Falls National Park and wildlife conservation area

(2) Please provide list of the permissions and the conditions to conduct the environmental field survey of the next project, Feasibility Study (FS) of Ayago Hydroelectric Power Project (HPP) in the area of Murchison Falls National Park and wildlife conservation area

(3) Please provide list of the permissions and the conditions to complete EIA after the FS project

3. Definition of Murchison Falls National Park and Wildlife Conservation Area

(1) Please provide Latest maps of National Park and Wildlife Conservation Area showing each boundary

(2) Please provide Definition of each zone established according to purpose of usage within wildlife conservation

4. Field Office

(1) How many UWA field offices and the staffs in the Murchison Falls National Park and wildlife conservation area?

(2) What kind of works conducted at these field offices?

(3) How to compile and analyze the field data?

(4) Possibility to collaborative work with the JICA FS Team

5. Existing Environmental Considerations

Please provide list of existing environmental considerations for the projects including HPP, oilfield, and tourism conducted within the boundary of national park and/or wildlife conservation area.

6. Contractor Information

Please provide the following contractor information to complete the environmental survey in the next FS project.

- Environmental contractor list including university, laboratory, NGO, and private consulting firm, which are competent for literature and field surveys in the field of biology, ecology, hydrology, water quality, social economy, and ecotourism

7. Run-of-River Power Development System

Please provide following information to complete the environmental survey in the next FS project.

- Adequate river flow (maintenance flow) in the recession area accompanied with Ayago HPP Run-of-River Power Development System from the viewpoint of ecosystem conservation

8. Transmission Line and Tower and Access Road

Please provide your recommendations on environmental and social considerations for the construction of transmission line and tower and access road in the national park and wildlife conservation.

9. Construction Works

Please provide your recommendations on construction works conducted during construction period of Ayago HPP, especially blasting, considering the negative impact on the environment and the local society.

10. Local Society

Could you please advise us how to make a good relationship between the residents and Ayago HPP from the view point of nature conservation and resident's social benefit?

11. Indigenous Peoples

IFC Performance StandardsPS7 and World Bank Safeguards Policy OP.4.10 stipulate the indigenous people conservation. Could you advise us of the laws relating to the conservation of the indigenous people and the any information on the indigenous people living around the Ayago HPP site?

12. Environmental Education

Could you please advise us of environmental education for the residents and the employee of Ayago HPP from the view point of nature conservation?

End

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Department of Water Resource Management (DWRM)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide responsible person in charge of this JICA project and the staffs

2. Laws and Regulations

(1) Please provide the information of Rights to the use of water for Hydropower

(2) Please provide list of the permissions and the conditions to conduct the environmental field survey of the next project, Feasibility Study (FS) of Ayago Hydroelectric Power Project (HPP) in the area of Murchison Falls National Park and wildlife conservation area

(3) Please provide list of the permissions and the conditions to complete EIA after the FS project

3. Run-of-River Power Development System

Could you please provide the following information to complete the environmental survey in the next FS project?

- Adequate river flow (maintenance flow) in the recession area accompanied with the operation of Ayago HPP Run-of-River Power Development System from the viewpoint of water resource management and conservation of ecosystem

End

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Uganda Electricity Transmission Co.Ltd. (UETCL)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide responsible person in charge of this JICA project and the staffs

2. Development Plan

Please provide the latest Grid Development Plan if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

End

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Ministry of Tourism, Trade and Industry (MTTI)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide responsible person in charge of this JICA project and the staffs

2. Ayago HPP Construction

(1) Please provide positive and negative impact generated by construction of Ayago HPP on the existing tourism business in the area of Murchison Falls National Park and wildlife conservation area

(2) Please provide any plans to mitigate negative impact and/or to enhance existing or new tourism business using Ayago HPP

3. Access Road

(1) Please provide positive and negative impact generated by construction of Ayago HPP access road on the existing tourism business in the area of Murchison Falls National Park and wildlife conservation area

(2) Please provide any plans to mitigate negative impact and/or to enhance existing or new tourism business using Ayago HPP access road

4. Transmission Line and Tower

Could you please advise us of the impact and the mitigation measures generated by constructing transmission line and tower in the area of Murchison Falls National Park and wildlife conservation area from the view point of landscape conservation?

End

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Ministry of Finance, Planning and Economic Development (MFPED)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide responsible person in charge of this JICA project and the staffs

2. Budget for Hydropower

(1) Please provide budget information for Hydropower Project in the Republic of Uganda

(2) Please provide including Energy Fund for Hydropower Project in the Republic of Uganda

(3) Please provide financial plan of Ayago Hydropower Project in the Republic of Uganda

End

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Ministry of Energy and Mineral Development

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project and environmental section

(2) Please provide the list of responsible person in charge of this JICA project and the staffs

2. Hydropower and Energy Planning

(1) Please provide the latest Grid Development Plan if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

(2) Please provide the latest The Development of a Power Sector Investment Plan for UGANDA if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

(3) Please provide the latest National Development Plan if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

(4) Please provide the latest Vision 2035 if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

(5) Please provide the budget information including Energy Fund for Hydropower Project in the Republic

of Uganda

(6) Please provide financial plan of Ayago Hydropower Project in the Republic of Uganda

(7) Please provide the Project Purpose of Ayago Hydropower Project as Government of Uganda.

3. Laws and Regulations

Please provide the following information, if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

(1) Rights to the use of water for Hydropower

(2) Permissions and conditions to conduct the seismic prospecting at Ayago Site

(3) Environmental Standards and Regulations

- Water Quality Standard and Effluent Standard for River and Lake
- Air Quality Standard and Emission Gas Control Standard
- Environmental Quality Standards for Noise & Vibration
- Laws and Regulations for Industrial Waste Management
- Laws and Regulations for Soil Contamination

(4) Natural Environment Conservation

- Conservation of Ecosystem and Biodiversity
- Conservation of Threatened and Endangered Species
- Conservation of National Park and Wildlife
- Conservation of Forest

(5) Social Environment Conservation

-Conservation of Cultural Heritage
- Conservation of Landscape
-Land Acquisition
- Resettlement and/or Relocation
- Conservation of Indigenous and Tribal People
- Water Use including Irrigation and Fishery in River and/or Lake
- Land use

(6) Environmental Assessment System (EIA)

(7) Guidelines

4. Related Governmental Organization

(1) Please provide list of the permissions and the responsible governmental organizations to conduct the environmental field survey in the next project, Feasibility Study (FS) of Ayago Hydroelectric Power Project (HPP) in the area of Murchison Falls National Park and wildlife conservation area

(2) Please provide list of the permissions and the responsible governmental organizations to complete EIA after the FS project

5. Existing Environmental Considerations

(1) Please provide list of existing environmental considerations for the projects including HPP, oilfield, and tourism conducted within the boundary of national park and/or wildlife conservation area

6. Contractor and Consulting firm Information

(1) Please provide the following contractor information to complete the Geological investigation, Topographical survey in the next FS project?

- Geological contractor list including university, laboratory, and private consulting firm, which are competent for literature and field surveys in the field of Core Drilling, Borehole TV observation , Seismic refraction prospecting, Ground mapping, Laboratory Test (including Physical and mechanical test, Construction material and Dissolution test) , Initial stress measurement
- Topographical contractor list including university, and private consulting firm, which are competent for literature and field surveys in the field of Topographic mapping scale 1:1000, River/ land cross-section Survey

(2) Please provide CAD operator list including university, laboratory, and private consulting firm, which has well skills and experiences for drawings of Hydropower project

(3) Please provide the following contractor information to complete the environmental survey in the next FS project

- Environmental contractor list including university, laboratory, NGO, and private consulting firm, which are competent for literature and field surveys in the field of biology, ecology, hydrology, water quality, social economy, and ecotourism

* The result of environmental study conducted in FS will be used to complete Environmental Impact Assessment prepared by MEMD. Therefore, the selection of the contractors must be very important works. Especially, biology and ecology must be key factors to complete EIA.

7. Land Acquisition and Involuntary Resettlement

Please provide the following information relating to land acquisition and resettlement.

- Legal procedures with respect to Permanent land take and temporary land take,
- Legal procedures with respect to resettlement,
- Current conflicts relating to land acquisition and resettlement,
- Mitigations to avoid the conflicts relating to land acquisition and settlement

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Uganda Electricity Generation Co.Ltd (UEGCL)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide Responsible person in charge of this JICA project and the staffs

2. Laws and Regulations

(1) Please provide Rights to the use of water for Hydropower

(2)

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: National Environment Management Authority (NEMA)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide Responsible person in charge of this JICA project and the staffs

2. Laws and Regulations

(1) Please provide Permission for seismic prospecting at Ayago site

(2) Please provide the following information for us, if the following laws and regulations were changed or newly established, since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011

1) Environmental Standards and Regulations

- Water Quality Standard and Effluent Standard for River and Lake
- Air Quality Standard and Emission Gas Control Standard
- Environmental Quality Standards for Noise & Vibration
- Laws and Regulations for Industrial Waste Management
- Laws and Regulations for Soil Contamination

2) Natural Environment Conservation

- Conservation of Ecosystem and Biodiversity
- Conservation of Threatened and Endangered Species
- Conservation of National Park and Wildlife

- Conservation of Forest

3) Social Environment Conservation

-Conservation of Cultural Heritage

- Conservation of Landscape

-Land Acquisition

- Resettlement and/or Relocation

- Conservation of Indigenous and Tribal People

- Water Use including Irrigation and Fishery in River and/or Lake

- Land use

4) Environmental Assessment System (EIA)

5) Guidelines

3. Indigenous Peoples

IFC Performance StandardsPS7 and World Bank Safeguards Policy OP.4.10 stipulate the indigenous people conservation. Could you advise us of the laws relating to the conservation of the indigenous people and the any information on the indigenous people living around the Ayago HPP site?

4. Related Governmental Organization

(1) Please provide list of the permissions and the responsible governmental organizations to conduct the environmental field survey of the next project, Feasibility Study (FS) of Ayago Hydroelectric Power Project (HPP) in the area of Murchison Falls National Park and wildlife conservation area

(2) Please provide list of the permissions and the responsible governmental organizations to complete EIA after the FS project

5. Existing Environmental Considerations

Please provide list of existing environmental considerations for the projects including HPP, oilfield, and tourism conducted within the boundary of national park and/or wildlife conservation area

6. Contractor Information

Please provide the following contractor information to complete the environmental survey in the next FS project.

- Environmental contractor list including university, laboratory, NGO, and private consulting firm, which are competent for literature and field surveys in the field of biology, ecology, hydrology, water quality, social economy, and ecotourism

7. Transmission Line , Tower and Access Road

Please provide your recommendations on environmental and social considerations for the construction of transmission line and tower and access road in the national park and wildlife conservation

8. Land Acquisition and Involuntary Resettlement

Please provide the following information relating to land acquisition and resettlement.

- Legal procedures with respect to Permanent land take and temporary land take,
- Legal procedures with respect to resettlement,
- Current conflicts relating to land acquisition and resettlement,
- Mitigations to avoid the conflicts relating to land acquisition and settlement

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Uganda Wildlife Authority (UWA)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide responsible person in charge of this JICA project and the staffs

2. Permission

(1) Please provide list of the permissions and the conditions to conduct the seismic prospecting of the next project, Feasibility Study (FS) of Ayago Hydroelectric Power Project (HPP) in the area of Murchison Falls National Park and wildlife conservation area

(2) Please provide list of the permissions and the conditions to conduct the environmental field survey of the next project, Feasibility Study (FS) of Ayago Hydroelectric Power Project (HPP) in the area of Murchison Falls National Park and wildlife conservation area

(3) Please provide list of the permissions and the conditions to complete EIA after the FS project

3. Definition of Murchison Falls National Park and Wildlife Conservation Area

(1) Please provide Latest maps of National Park and Wildlife Conservation Area showing each boundary

(2) Please provide Definition of each zone established according to purpose of usage within wildlife conservation

4. Field Office

(1) How many UWA field offices and the staffs in the Murchison Falls National Park and wildlife conservation area?

(2) What kind of works conducted at these field offices?

(3) How to compile and analyze the field data?

(4) Possibility to collaborative work with the JICA FS Team

5. Existing Environmental Considerations

Please provide list of existing environmental considerations for the projects including HPP, oilfield, and tourism conducted within the boundary of national park and/or wildlife conservation area.

6. Contractor Information

Please provide the following contractor information to complete the environmental survey in the next FS project.

- Environmental contractor list including university, laboratory, NGO, and private consulting firm, which are competent for literature and field surveys in the field of biology, ecology, hydrology, water quality, social economy, and ecotourism

7. Run-of-River Power Development System

Please provide following information to complete the environmental survey in the next FS project.

- Adequate river flow (maintenance flow) in the recession area accompanied with Ayago HPP Run-of-River Power Development System from the viewpoint of ecosystem conservation

8. Transmission Line and Tower and Access Road

Please provide your recommendations on environmental and social considerations for the construction of transmission line and tower and access road in the national park and wildlife conservation.

9. Construction Works

Please provide your recommendations on construction works conducted during construction period of Ayago HPP, especially blasting, considering the negative impact on the environment and the local society.

10. Local Society

Could you please advise us how to make a good relationship between the residents and Ayago HPP from the view point of nature conservation and resident's social benefit?

11. Indigenous Peoples

IFC Performance StandardsPS7 and World Bank Safeguards Policy OP.4.10 stipulate the indigenous people conservation. Could you advise us of the laws relating to the conservation of the indigenous people and the any information on the indigenous people living around the Ayago HPP site?

12. Environmental Education

Could you please advise us of environmental education for the residents and the employee of Ayago HPP from the view point of nature conservation?

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Department of Water Resource Management (DWRM)

JICA

September 30, 2011

In order that the preparatory study will be carried out appropriately, please answer this questionnaire correctly and concretely by providing necessary information and documents. The answers might be discussed in the meetings with each authority and department. It would be appreciated if right person to discuss with would be prepared in the meeting and written answers and documents would be submitted to JICA study team by October 11, 2011 (Tuesday).

Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide responsible person in charge of this JICA project and the staffs

2. Laws and Regulations

(1) Please provide the information of Rights to the use of water for Hydropower

(2) Please provide list of the permissions and the conditions to conduct the environmental field survey of the next project, Feasibility Study (FS) of Ayago Hydroelectric Power Project (HPP) in the area of Murchison Falls National Park and wildlife conservation area

(3) Please provide list of the permissions and the conditions to complete EIA after the FS project

3. Run-of-River Power Development System

Could you please provide the following information to complete the environmental survey in the next FS project?

- Adequate river flow (maintenance flow) in the recession area accompanied with the operation of Ayago HPP Run-of-River Power Development System from the viewpoint of water resource management and conservation of ecosystem

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Uganda Electricity Transmission Co.Ltd. (UETCL)

JICA

September 30, 2011

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Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide responsible person in charge of this JICA project and the staffs

2. Development Plan

Please provide the latest Grid Development Plan if it was changed or newly established since the end of the former JICA project, Project for Master Plan Study on Hydropower Development in the Republic of Uganda, March 2011.

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Ministry of Tourism, Trade and Industry (MTTI)

JICA

September 30, 2011

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Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide responsible person in charge of this JICA project and the staffs

2. Ayago HPP Construction

(1) Please provide positive and negative impact generated by construction of Ayago HPP on the existing tourism business in the area of Murchison Falls National Park and wildlife conservation area

(2) Please provide any plans to mitigate negative impact and/or to enhance existing or new tourism business using Ayago HPP

3. Access Road

(1) Please provide positive and negative impact generated by construction of Ayago HPP access road on the existing tourism business in the area of Murchison Falls National Park and wildlife conservation area

(2) Please provide any plans to mitigate negative impact and/or to enhance existing or new tourism business using Ayago HPP access road

4. Transmission Line and Tower

Could you please advise us of the impact and the mitigation measures generated by constructing transmission line and tower in the area of Murchison Falls National Park and wildlife conservation area from the view point of landscape conservation?

QUESTIONNAIRE
ON
THE PREPARATORY STUDY (FEASIBILITY STUDY)
ON
AYAGO HYDROPOWER PROJECT
IN
THE REPUBLIC OF UGANDA

For: Ministry of Finance, Planning and Economic Development (MFPED)

JICA

September 30, 2011

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Please provide the following information and documents:

1. Organaization

(1) Please provide current organization charts including related to Ayago Hydropower Project

(2) Please provide responsible person in charge of this JICA project and the staffs

2. Budget for Hydropower

(1) Please provide budget information for Hydropower Project in the Republic of Uganda

(2) Please provide including Energy Fund for Hydropower Project in the Republic of Uganda

(3) Please provide financial plan of Ayago Hydropower Project in the Republic of Uganda

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