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EASTERN NILE POWER TRADE PROGRAM STUDY

AfDB



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with participation of :

EPS (Egypt)
Tropics (Ethiopia)
YAM (Sudan)

- INCEPTION REPORT -

to

Eastern Nile Technical Regional
Office (ENTRO)

APPENDICES

7 December 2006



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0. LIST OF UTILITIES AND KEY PERSONNAL MET

0.1. EGYPT

EEHC

- Dr. Kamel Yassin, Executive Director Planning, Research, Power projects
- Eng. Fawzia bou Neima, Board Member for production, Transmission & Distribution Companies Affairs
- Eng. Abdel Rahim A. Helmi Hamza, Managing Director Electrical Network Studies

0.2. ETHIOPIA

EEPCO

- Eng. Zelalem G/Hiwot, Head Power System Planning Office
- Eng. Adede Tesfye
- Eng. Tesfaye Batu, Regional interconnection
- Eng. Kifle Horo, Generation construction
- Eng. Daniel Melatu
- Eng. Getye Tesfaye, Transmission, substations O&M
- Eng. Atemu Tenibo, Planning,
- Eng. Abrawa Abebe, IPP

EPA

- Dr. Yonas Michael, EIA specialist, EPA
- Mr Geremew G/Selassie & Tayech Ourgicho, Editors of Tefetro

Ethiopian Wildlife and Natural History Society

- Kinf Abebe & Mengistu Wodafrash

Ethiopian Mapping Authority

- Ato Kassaye and Degelo Sendabo

AA University

- Dr Wolde Bewket, , Geography Department
- Dr Abeje Berhanu, Sociology Department
- Dr Bayu Chane, Faculty of Technoloy, Civil Engineering

Ministry of Water Resources

- Eng. Tefera Beyene, ENSAPT leader
- Eng. Michael Abebe, Head, Dams & Hydropower Design Department
- Eng. Messele Fisseha
- Eng. Solomon Tassew, Team Leader, Power Planning & Dam Study & Design

ENTRO

- Mr Mekuria Tafesse, Executive Director
- Dr. Ahmed Khalid, Senior Regional Projects Coordinator
- Dr. Fatma Moustafa, Manager of the PCU
- Dr. Hazim Hanafi, Power System Analyst
- Dr. Solomon Abate, Regional Project Coordinator (WSM & IRD)
- Dr. Wubalem Fekade, CBSI LS ENTRO-Based Social Development Officer
- Dr. Babiker Abdalla, Environmentalist
- Mr Jelal Shafi, Power Economist
- Mr Tigabu Adane, Procurement Officer
- Mr Hani Fouad Salama, Head of Finance and Administration

WB

- Mr E.V.Jagannathan, Senior Water Resources Eng.

0.3. SUDAN

Ministry of Energy and Mines

- Eng. Amin Sabri, Secretary General

Ministry of Environment and Physical Development

- Therasa Siricio Iro, State Minister.

Ministry of Irrigation & Water Resources

- Eng. Ibrahim Salih Adam, Vice Chairman Water Resources Technical Organisation
- Dr Mohamed Bahr Eldein Abdalla, Undersecretary
- Dr. Salaheldin Yousif, Chairman Water Resources Technical Organisation

Irrigation Department of Dongola

- Kamal

Ministry of Science and Technology, Agricultural Research and Technology Corporation

- Mr Elfatih Elajib

NEC

- Eng. Bushra Abdalla Gadalla, Acting General Director
- Eng. Musaad Abdalla Mohamed, Generation Director,
- Eng. Tageldin Faragalla Dalil, Networks Planning Manager
- Eng. Osman Ahmed A / Kariem, Director General Directorate of Planning & Projects

Remote Sensing Authority

- Ms Amna Ahmed Hamid

Ministry of Water Resources and Irrigation

- Dr. Abdel Fattah Metawie, Chairman
- Eng. Ibrahim A. El-Desouky, HRI Acting Director
- Eng. Mohamed Nasser Ezzat, Advisor

1. GEOGRAPHIC MAP OF PROJECT LOCATION

IBRD 30785



2. DATA COLLECTION

2.1. EGYPT

2.1.1. SYNTHESIS

Print EXCEL file :

data collection Egypt 071206.xls

2.1.2.DATA FOR TRANSMISSION NETWORK

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- data collection_Egypt_transmission041206.xls

2.2. ETHIOPIA

2.2.1. SYNTHESIS

Print EXCEL file :

data collection Ethiopia 071206.xls

2.2.2.DATA FOR TRANSMISSION NETWORK

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- file data collection_ Ethiopia_transmission041206.xls

2.3. SUDAN

2.3.1. SYNTHESIS

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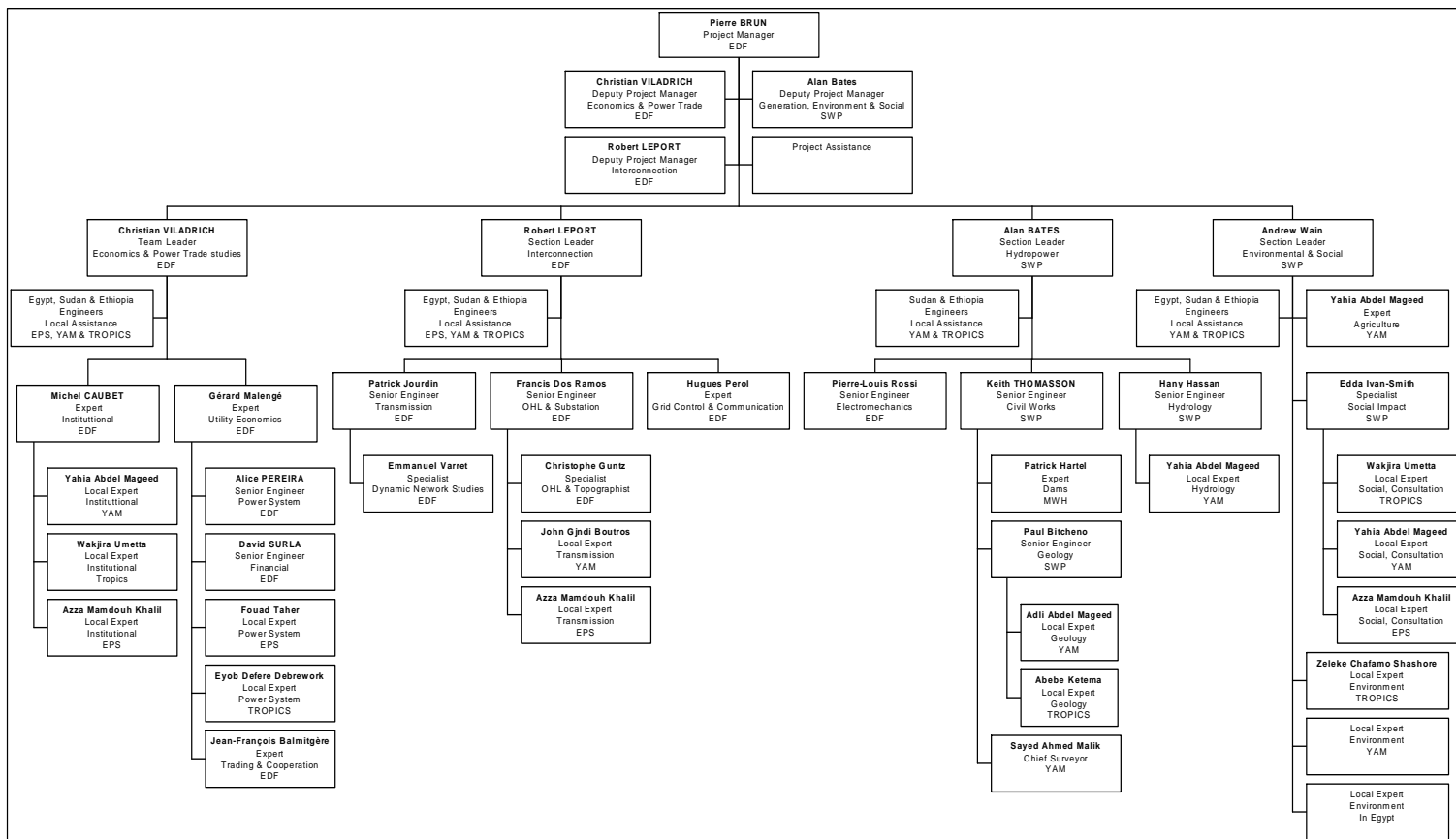
- "data collection Sudan 071206.xls"

2.3.2.DATA FOR TRANSMISSION NETWORK

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- data collection_Sudan_transmission041206.xls

3. ENTRO PROJECT ORGANISATION



4. SITE VISITS OF HYDROPOWER PROJECTS

4.1. LOG OF SURVEY FLIGHT, MONDAY 23RD OCTOBER 2006 – TUESDAY 24TH OCTOBER 2006

Time	Roughly estimated distance km	Survey plane location	Observations, and some comments for Initial Environmental Assessment Team
0821 to 1153	> 850	Bole Airport to Mandaya, Border and Asosa	Flight (Cessna 206) from Bole airport to Asosa from 0821 to 1153 hours. 3 hours 32 minutes. Pilot indicated normal survey speed along Abay at 130 knots or 150 mph or 240 km/h. Thus speed along river about 4 km per 1 minute. Thus total time 212 minutes is about or greater than 850 km (Note: this includes some greater flight speed between Border and Asosa). On arrival at Asosa for refuelling, prolonged heavy rain prevented refuelling and return journey. This unscheduled delay caused return flight to take place on Tuesday morning, 24 th October.
0821	-	Bole Airport	Take-off
0836	60	En route for Muger/Abay confluence	Big expanse of cultivation and escarpments as far as the eye can see to W/N/E. Dense rural population. These are some of principal sources of high Abay sediment loads.
0839	12	Muger basin	Muger Cement factory ahead, broken escarpments, few trees
0840	4	Muger basin	Over confluence of 2 tributaries – bed loads. Dam behind cement works with very cultivated catchment area, looking green and yellow - oil seeds? Quarry and elevator below factory.
0843	12	Muger basin	Muger Cement factory on left, dam. Muger river on right.
0845	8	Muger basin	Crossing W to E valley with headward gully erosion on left, advancing into plateau. Textbook case.
0846	4	Muger basin	First road – W to E below on flat-topped ridge to a town on the right. New wide basin from ridge, escarpment ahead, many ridges, escarpments.
0850	16	Muger basin	Confluence to left. Muger on right? Big valleys. Less cultivation below left, a green-sided gully. Many confluences on left, green below, much less cultivation. Tree cover and some green fields. (Yellow fields finished).
0851	4	Muger basin	Road on ridge, Muger on left. Left bank valley with bed of sediment.
0855	16	Muger basin	Crossing Muger, left to right. Many tributaries here.
0856	4	Muger basin	Tef fields light green here – to be harvested in January.
0857	4	Muger basin	See Abay to right. Abay/Muger confluence to right.
0900	12	Abay (u/s Karadobi)	Approaching Abay. Settlements on plateau on left.
0903	12	Abay (u/s Karadobi)	Over Abay.

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0906	12	Abay (u/s Karadobi)	Broad Guder valley on left, green.
0907	4	Abay (u/s Karadobi)	Over Guder river. Location is 7 minutes (28 km) from near Muger/Abay confluence. Map suggests 30 km, so confirmed.
0908	4	Abay (u/s Karadobi)	Big dambo-like feature on left bank plateau top. Karadobi dam site must be on right here.
0913	20	Abay u/s Mandaya	Tight gorge on right. (Originally thought to be Karadobi dam site, but valley on left not big enough for Guder – we had passed Karadobi dam site).
0914	4	Abay u/s Mandaya	Valley on left, small tributary. Broad green patches in distance on left – near Fincha?
0915	4	Abay (u/s Manaya)	Tributary on right. Suggest Yeda river or could be Chemoga?
0917	8	Abay (u/s Manaya)	Fincha reservoir first seen, far left.
0920	12	Abay (u/s Manaya)	Compass indicates we are now due north of Fincha reservoir. Good view of big plateau to north – long distance from Abay, i.e. long distance pedestrian access from northern plateau to Abay river.
0923	12	Abay (u/s Manaya)	Waterfall seen on left.
0925	8	Abay (u/s Manaya)	Abay turning NNE into straight reach.
0934	36	Abay (u/s Manaya)	Good tree cover below left. Lighter vegetation on Abay banks and hills to north. No roads seen. Thin tree cover on slopes.
0938	16	Abay (u/s Manaya)	Village on left of survey plane - on high ground.
0939	4	Abay (u/s Manaya)	Big valley on left. River swings south. Road bridge here is important location for EA of upper Mandaya reservoir. Very important access for EA surveys. A big Mandaya reservoir project would require replacing this bridge.
0940	4	Abay (u/s Manaya)	Very good woodland cover left side. Best seen so far.
0941	4	Abay (u/s Manaya)	Woodland continuing.
0942	4	Abay (u/s Manaya)	Big river Abay loop to north, seen on right.
0944	8	Abay (u/s Manaya)	Cutting across land to avoid following river loop.
0945	4	Abay (u/s Manaya)	Out of river loop now. Rejoined Abay. Very good woodland in the loop and to left/south side. Clouds ahead.
0946	4	Abay (u/s Manaya)	Plane on right bank side of Abay. Some cultivation and grazing area seen on right bank.
0950	16	Abay (u/s Manaya)	Left bank side very good woodland. Right bank side some clearings.
0954	16	Abay (u/s Manaya)	Ridge on left side. Top of ridge cleared.
0955	4	Abay (u/s Manaya)	Left side plateau with clearings. Right side cloud and woodland. This river is Red Nile not Blue Nile.
0958	12	Abay (u/s	Left side clearings in woodland. Right side no clearings. Clouds.

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		Manaya)	Sand/mud bars on most river bends – seen along whole length of Abay. Not repeatedly mentioned in these survey notes.
1000	8	Abay (u/s Manaya)	Gentler slopes on LB and RB. Woodland.
1002	8	Abay (u/s Manaya)	Loop.
1005	12	Abay (u/s Manaya)	Huts on left side, above potential reservoir.
1007	8	Abay (u/s Manaya)	More clearings on both sides. More activity.
1009	4	Abay (u/s Manaya)	More clearings on left side. Good woodland has gone. Will woodland be converted to cultivation; will it all disappear? Is population noticeably increasing in these areas?
1012	12	Abay (u/s Manaya)	First sighting of Didesa ahead, on left.
1016	16	Abay (u/s Manaya)	Over Didesa / Abay confluence. Plane circling confluence. Out of circle. Photos. No roads seen. No settlements seen.
1019		Mandaya	Mandaya. Suitable “helipad” on left bank by dam site seen.
1020		Mandaya	Distinctive dambo-like feature above left bank, d/s of dam site.
1024		Mandaya	End circling. Dambo is one of three. Very distinctive. Photos.
1025	4	Abay u/s Border	Left bank tributary with waterfalls.
1026	4	Abay u/s Border	RB tributary. Two islands in Abay below tributary confluence.
1027	4	Abay u/s Border	Village under plane, left bank of islands. Track on LB. Inundation area. Use track/road to visit village during EA surveys.
1028	4	Abay u/s Border	LB tributary. Big N/S ridge seen ahead on right side.
1029	4	Abay u/s Border	Three villages on left side with tracks. CI roofs.
1031	8	Abay u/s Border	Red earth on left bank side. Erosion.
1033	8	Abay u/s Border	River course is NNE with bend to left at far end of reach.
1035	8	Abay u/s Border	Left bank side, big areas cleared. Green and brown earth. No houses.
1036	4	Abay u/s Border	On Abay left side, 3 No. CI roofs in clearings. Abay looking wider now.
1038	8	Abay u/s Border	Some CI roofs on left side. Clearings and brown areas. Many.
1040	8	Abay u/s Border	Clearing on right bank side. Photo.
1041	4	Abay u/s Border	Clearing on left bank side by island. Photos.
1042	4	Abay u/s Border	Monadnock on left side; green.
1044	8	Abay u/s Border	Dabus river seen to left. Some rocky outcrops continue on left side.
1045	4	Abay u/s	Dabus river red. Photo.

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		Border	
1046	4	Abay u/s Border	Cleared area on left bank side of Dabus/Abay confluence. Village. Is this Abatimbo el Gumas? Inspect during EA work if access from Asosa permits.
1047	4	Abay u/s Border	Two big cleared patches on right bank side on high ground. (Photos of them later at 1049 hours)
1048	4	Abay u/s Border	Two sand rivers on left bank side.
1049	4	Abay u/s Border	Overgrazing in woodland, bare soil on left bank side. Photo. Many scars, otherwise woodland. Assess shifting cultivation traditions.
1051	8	Abay u/s Border	Large tributary on left bank. Small flow in big bed.
1052	4	Abay u/s Border	3 peaks above clouds on right bank side. Big ridge in distance right bank side.
1054	8	Abay u/s Border	Two houses on RB side. Two hills on left bank side horizon. Cloud increasing.
1055	4	Abay u/s Border	Beles river confluence with Abay. Is there a Beles EIA report? What does it say about induced river channel erosion when diverted water from Lake Tana is transferred to Beles at hydropower station now under construction (by Salini)? Will cause additional sediment load for Roseires reservoir, or Border reservoir in future. Chase up this report (but later found not known by EPA).
1058	12	Abay u/s Border	Big village on right bank side. Would be flooded by Border reservoir. Must be assessed. "Yellow" tributary on LB side.
1059	4	Abay u/s Border	Over "alternative" dam site. This is a "tight" site – is it too tight to accommodate spillway gates and turbines?
1100	4	Abay u/s Border	Border mountains on right in front.
1101	4	Abay u/s Border	See main road on RHS of river. Road to be flooded by Border reservoir. See cultivated tributary river valley between two areas of high ground on left bank side. This small but locally important valley to be flooded by Border reservoir. See peak of highest of these hills – the more downstream of the two groups of hills on left bank side.
1103	8	Abay u/s Border	Road. Photo.
1105		Border	Clockwise circle of Border dam site. Photo taken from left bank side.
1107		Border	Looking upstream at dam site, from left bank side.
1109		Border	Over dam site. Photos, including LB tributary.
1111		Abay u/s Border	Depart Border for Asosa. Route from North to South.
1113		Abay u/s Border	LB valley to be inundated by Border. Much used. Assess this side of river. Must be/is there a ferry here?
1136		Border to Asosa	Crossing big river. Tunit river (flows to Sudan and Roseires reservoir).
1137		Border to Asosa	Over hills.
1138		Border to Asosa	Road nearly at river. Potential mini hydro site in narrow ridge.
1139		Border to	Plane following road. Tunit river to left (east) of road going to

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		Asosa	Asosa? Village near road by tributary before its confluence with Tunit river.
1141		Border to Asosa	Straight road. Hazy.
1143		Border to Asosa	Good woodland. Looking down on fronds of young cypress?
1145		Border to Asosa	All cultivation. Big area. Green. Two big villages, thatch roofs.
1147		Border to Asosa	State farm. Maize.
1150		Border to Asosa	Over Asosa town. Appears to have planned gridiron layout pattern. CI roofs.
1152		Border to Asosa	Windsock on airstrip.
1153		Asosa	Touch down on Asosa landing strip.

Survey Flight Tuesday 24th October

Zelealem Abebe, Alan Bates, Andrew Wain. Sunny morning but clouds increasing.

Time	Roughly estimated distance km	Survey plane location	Observations and Comments for Initial Environmental Assessment Team
0912 to 1134		Asosa to Bole Airport	Flight from Asosa to Bole airport from 0912 to 1134 hours. Total survey time 2 hours 22 minutes. Survey speed 130 knots (150 mph or 240 km/h, 4 km per 1 minute) and faster than this when leaving river survey areas, so calculation of distances not so straightforward as on the day before.
0912	-	Asosa Airstrip	Take-off. See new pylon line. Recent experience here of power line ROW compensation and other mitigation experiences, useful for EA team when at Asosa.
0920		Asosa to Mandaya/Didesa	Dabus river seen to left ahead. Woodland with clearings.
0924		Asosa to Mandaya/Didesa	Over Dabus rapids. Red river.
0925		Asosa to Mandaya/Didesa	More clearings/cultivation.
0926		Asosa to Mandaya/Didesa	More clearings/cultivation. Thatched huts. Lots of brown areas on RHS. Erosion.
0930		Asosa to Mandaya/Didesa	Brown areas, erosion. Ridges running N-S.
0931		Asosa to	Over road/ridge. Village. Road going to Abay at

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		Mandaya/Didesa	Dabus confluence, between Mandaya and Border? If so, road very helpful for initial EA of Border HEP, including assessment of Dabus valley protected hunting area. Lots of yellow weed below.
0934		Asosa to Mandaya/Didesa	More than 50% cleared. Cross river valley which is running towards Abay. Ridges.
0936		Asosa to Mandaya/Didesa	Waterfalls seen on RHS in woodland.
0937		Asosa to Mandaya/Didesa	Over big ridge. Abay seen to left in far distance.
0941		Asosa to Mandaya/Didesa	Good woodland cover, few clearings.
0943		Asosa to Mandaya/Didesa	Three dambo-like features seen on left, downstream of Mandaya. "Helipad" feature at Mandaya seen on left. These "dambos" will not be inundated by Border or Mandaya reservoirs – too high, but what are they ?
0944		Asosa to Mandaya/Didesa	Approaching Abay. Woodland and clearings. No roads.
0945	4	Mandaya	Mandaya – two photos.
0947	8	Didesa	Didesa/Abay confluence. Good woodland cover on Abay right bank side. Good woodland cover on Didesa left bank side. Difficult to envisage which land below would become islands in Mandaya reservoir.
0949	8	Didesa	Flying up Didesa valley with Didesa always on right of plane. Photos of Abay u/s of confluence. Abay red; Didesa river is less red today.
0950	4	Didesa	Didesa reach photo, looking upstream.
0953	12	-	Views of Abay upstream of Didesa confluence – three reaches of Abay seen at same time, because of Abay loop.
0954	4	Didesa	Everywhere, good woodland cover and clearings. Photo. Clouds.
0958	16	Didesa	Over confluence with Anger/Waja Wenz.
0959	4	Didesa	End of main Didesa survey. Fly to Addis via Waja Wenz subcatchment.
1000		Didesa catchment area	Two tributaries close together joining Didesa.
1001		Didesa catchment area	Good woodland cover below, both sides. Cloud increasing.
1003		Didesa catchment area	Looking north to Abay, big landscape of woodland and clearings. Clouds.
1004		Didesa catchment area	Clearings. Trees or maize cut and lying flat, yellowish straw? Clouds.
1017		Didesa catchment area	Cleared. Widespread cultivation, green. Road and village on north side.
1018		Didesa catchment	Former state farms, three, on south side. No trees.

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		area	Cooperatives now. (These are clearly seen on Abay Master Plan landuse map). What will be nutrient loading – for Mandaya/Border reservoir weed growth – from these and other agricultural areas?
1021		Mandaya catchment area	Cross road leading to Ayana/Mukasan Abay bridge. Nekemte town on right of plane. No trees here. This will be important road access for EA team to upper end of Mandaya reservoir and north bank side. Also, good information sources in Nekemte town.
1022		Mandaya catchment area	Over a biggish river now.
1025		Mandaya catchment area	Following main road, west to east.
1033		Mandaya catchment area	Fincha reservoir seen ahead, to left.
1036		Mandaya catchment area	Several bodies of water seen to left. Arms of Fincha reservoir?
1037		Mandaya catchment area	Town (Mara Seba?) below on left.
1041		Mandaya catchment area	Big water expanse to left, and smaller water areas further away to north. Green weed over south of reservoir, and fringing other banks. Can we expect these (or other) weeds on Mandaya and Border reservoirs? What are seasonal wind directions at Mandaya and Border reservoirs near intake areas? Which mitigation measures used for weeds at Fincha?
0944		Mandaya catchment area	Over wetland fingers, shape of river drainage pattern. Drainage to Guder?
0947		Mandaya catchment area	Green arms of wetland continuing.
0948		Mandaya catchment area	Land below drops through escarpment to lower ground to north. Similarly, approaching drop through escarpment in front, to east. Green arms of wetland continuing to escarpment edges. These fingers drain to Guder? They are like vleis or dambos.
1052		Travelling eastwards	Over escarpment edge now, leaving vleis behind.
1057			Look back to vleis and escarpment edge, photo.
1058			Over river in trough. No intensive cultivation now but not natural vegetation.
1102			Factory smoke seen in distance, ahead to left.
1103			Pink erosion patch to north.
1110			Very tidy agriculture below. Plateau and valley.
1112			Town below. It is Ambo. Probably now in Awash catchment area and for rest of flight to Addis.
1117			Glass houses, many on south side. Teff

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			everywhere also.
1122			Over glass houses, Zelealem says for chrysanthemums. See Gafarsa reservoir ahead on north side.
1125			Gafarsa on left ahead.
1127			Gafarsa reservoir with very cultivated catchment area. Photos.
1128			Over high ground ridge to see Addis below.
1134			Landed at Bole airport.

Consultations during Inception Mission in Ethiopia, 21st to 31st October 2006

Meeting Date	Person	Issues
21/10/06	Dr. Babiker Ibrahim (ENTRO)	Introduction of Zelealem Abebe (TROPICS team leader for Mandaya and Border initial environmental assessment studies) to Babiker Ibrahim. Emphasis on obtaining primary field data. First observations of 1:50,000 maps with indicative reservoir levels 600 m at Border and 800 m at Mandaya.
24/10/06	Ato Yonas Teklemichael, EIA specialist, EPA	Seeking EPA views on depth of Initial Environmental Assessment for pre-feasibility studies. Policy, legal and administrative chapter in recent E-S power system interconnection ESIA study is good and may be used in scoping report where relevant, with acknowledgments to SMEC and ENTRO. Very clear that scoping report must present as much primary data as practicable, including through listening surveys. It is not appropriate to ask potential resettlement interviewees about preference for cash or land for land – this is at full feasibility stage. Premature to unsettle people at scoping stage when 3 projects being considered. There is currently no list of qualified local consultants for EIA work – he is pressing legal department to consider this. Scoping reports must provide full TORs for EIA studies.
24/10/06	Geremew G/Selassie and Tayech Ourgicho Editors of Tefetro, EPA	Soil conservation and education needs. Abay delivery of 100 Mt/y to cripple Roseires reservoir. Obtaining copies of Tefetro magazine, including the magazine issue with interview with Ato Yonas Teklemichael (EPA) re EIA procedures.
24/10/06	Dr. Babiker Ibrahim (ENTRO)	Sourcing digital copies of figures in Abay master plan.
25/10/06	Kinfe Abebe & Mengistu Wondafrash. Ethiopian Wildlife and Natural History Society	Kinfe Abebe is Executive Director. Mengistu Wondafrash is Biodiversity Conservation Team Leader and Programmes Director. Described scoping study and Border reservoir's potential impact on Dabus Valley – candidate for IBA. Still candidate because no more data. Will mention in our report, and include need for ornithologist in TOR for full EIA, if

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		<p>Border selected. This will involve at least two surveys – in both migration seasons – Oct to Feb, and end April to early September (back to breed in Europe). 3 No. Bald Ibis are satellite tagged, Syria/Yemen/Ethiopia migration – RSPB coordinated; Mengistu Wondafrash informed of location and found them with GPS. Well done. We are advised to see Investment Offices in the two Regions to learn about other ongoing and proposed developments – Region 4 in Asosa and Oromio office in Addis.</p> <p>Mengistu Wondafrash visited RSPB and Birdlife International in UK; knows Thomas and Leon Bennum at BI in Cambridge (both known to ASW). Sudan wetlands contact is Ali Kodi (Wildlife, Gov of Sudan). Ethiopian government dept head WCD is in Min of Ag.</p>
30/10/06	Ato Kassaye Ethiopian Mapping Authority	<p>Reported major road mapping error (by about 10 km) on Sheet 1135 C4, found when travelling to Border dam site. Sheets 1135 C3 (with Border dam site) and 1035 A1 are available as orthophoto maps.</p>
30/10/06	Dr Wolde Bewket AA University, Geography Department	<p>Regional Atlas of Oromio available from state office. Atlases for Benshangul-Gumuz and Amhara may be under preparation. His interest is in watershed management – thesis on erosion of Chemoga catchment area, 366 km². Resettlement at Pawe –MSc dissertation now going on by postgraduate Yitayal Balay under supervision of Dr. Tegegne G.</p> <p>Research on climate change by many includes Deklan Conway at Norwich, UK. Predicted Ethiopia’s climate change - temperature increases, rainfall intensity increases, more erosivity, but no agreement on changes in quantity of rainfall. Research on Addis rainfall from 1890s – no evident change in quantity. List of publications - 5 papers in 2000s.</p>
30/10/06	Dr. Abeje Berhanu AA University, Sociology Department	<p>Involved in consultancy work for ENTRO - synthesising/blending country reports on socio-economic features of the Abay/Nile river basin with no political frontiers. Discussion on linguistic areas mapping.</p>
30/10/06	Dr. Bayu Chane AA University Faculty of Technology, Civil Engineering	<p>Discussion on erosion/sedimentation problem. Noted forthcoming December 2006 symposium under NBI series. Dr. Chane is on technical committee. So far, no paper offered on Abay water management issues. Low agricultural productions cannot sustain farmer’s life; incomes decreasing; marginal land being used, even ropes to cultivate inaccessible steep areas.</p> <p>Introduced to work of Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA). Challenged to how show benefit to farmer of his efforts to Reduce sediment loads by his soil conservation works, and Reduce Carbon emissions by using less fuel wood. Examples of forced displacement of people at small dams in</p>

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		Ethiopia to protect dam catchments – considered OK but population is not happy, and is predicted to return in so many years.
31/10/06	Ato Kassaye and Degelo Sendabo, (Head of Remote Sensing) Ethiopian Mapping Authority	Purchased orthophoto maps at 1:50,000 of Sheets 1135 C3 (with Border dam site) and 1035 A1 (further south). Landsat 2000 available, hard copies and CD for whole country. Viewed sample of Landsat TM for 170/052 for Border (already loaded). Image to south is 170/053 - for Mandaya if not on first quoted image scene. Noted preference for Quickbird and Ikonos at cost of USD29/km2.

Consultations during Inception Mission in Sudan, 1st to 7th November 2006

Meeting Date	Person	Issues
1/11/06	Ibrahim Salih Adem Ministry of Irrigation and Water Resources – focal point for study	Khartoum. On arrival in Khartoum from Addis Ababa, advise on ENTRO study inception stage and proposed safari to Dal. Note: Amin Sabri at NEC (focal point for study) not available – out of country.
1/11/06	Yahia Abdel Mageed YAM Consultants	Khartoum. Scott Wilson/YAM contract business but also discussion on Abay water resources development scenarios.
2/11/06	Dr. Babiker Ibrahim (ENTRO)	New Hamdab. Visited Merowe dam's resettlement scheme at New Hamdab, seeing village housing, schools, mosques, community areas. Visited developing irrigation areas and canal system. (Babiker Ibrahim attended whole safari and all meetings in Khartoum).
3/11/06	Kamal Irrigation Department at Dongola	Dongola. Visited key river gauging station at Dongola, downstream of ferry on right bank. Kamal then attended two-day visit to Dal and other cataracts. Discussed hydrometric issues relating to other Nile stations, observers, gauging by Egyptian team, etc.
4/11/06	Residents at Dal	Dal. Discussions on possible project and resettlement concepts; fish (caught and eaten daily), bird flyway, sand dune encroachment, water supply. A left bank village at upstream end of cataract reach. No vehicles here. Note. Dal is 278 km from Dongola, and 825 km from Khartoum.
5/11/06	Commissioner at Dongola	Dongola. Courtesy call to inform him about ENTRO project and future field studies relating to Dal.
5/11/06	Elfatih Elajib, New Hamdab Research Station, Ministry of Science and Technology, Agricultural Research and	New Hamdab Research Station. Watched promotional video of Merowe project. Discussions on establishment of research centre, crop trials and responses to organic and inorganic fertilizers.

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	Technology Corporation	
6/11/06	Tageldin Faragalla Dalil NEC	Khartoum. Report on 4-day safari to Kajbar and Dal cataracts. Inspected one volume of Russian feasibility report on Kajbar – but no contours. There had been significant protests about resettlement to President by local people; some claim manipulation of local people (to protest).
6/11/06	Bushra Abdalla Gadalla, NEC	Khartoum. Description of pre-feasibility studies to Acting General Manager. Emphasis on Ethiopian sediment transport problem for all dams.
6/11/06	Ibrahim Salih Adem Irrigation and Water Resources	Khartoum. Report on 4-day safari to Kajbar and Dal cataracts. Chasing reports by Coyne/Gibb; Russian Kajbar volumes; and recession agriculture by FAO Africover – National Forest Corporation or Remote Sensing. Discussion of UNESCO work on sand encroachment of Lake Nasser/Nubia – only TORs, not a report.
7/11/06	Bader El Din Ali Mohamed, Mierag Space Technologies Company	Khartoum. 1:100,000 mapping unknown of Dongola – Dal - Akasha area. Only available mapping is at 1:250,000. Copy printed from Akasha in north to Dongola in south - many old features recorded on this map (probably dated 1930s). Cost estimate to be requested for mapping this long reach from remote sensing with 2.5m contour intervals. Present quotation in Inception Report.
7/11/06	Ibrahim Salih Adem, Irrigation and Water Resources	Khartoum. Discussion of 1988 and 2006 floods. 1998 was normal flood from upstream, augmented by local intense runoff along main Nile. No early warning system in place; much damage. 2006 flood is new historical maximum - this was later disputed – see note below. Thus flooded area and recession agriculture potential at historical maximum this year. What is return period? National Defence early warning system in place; much damage was avoided and assistance was provided. NBI Flood Project now moving to 2 nd phase with national flood forecasting centres in Ethiopia and Sudan, and reaching out to communities. Russian reports on Kajbar unavailable now; Main report volume of Coyne and Gibb found; some pages on Dal copied.
7/11/06	Ms Amna Ahmed Hamid, Remote Sensing Authority	Khartoum. On-screen demonstration of mapping of Africover – project led by National Forest Corporation. Amna participated in the project. Potential for abstracting gross areas (in hectares) of recession agriculture and other Nile water dependent vegetation along main Nile; Probably not so clear in Blue Nile because of simultaneous seasonal rainfall at time of river flooding. RSA is

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		now working on year 2000 imagery. There is a postgraduate student, Yasir Moheildeen at University of Surrey, UK, doing something similar – discuss in UK.
	Dr. Asim Ibrahim El Moghraby, Consultant	Khartoum. Considered that the recent Nile flood in 2006 was not the historical maximum – a flood in the 1940s being the greatest, followed by 1988 flood.

4.2. PHOTOS REPORT



Bridge on route to Border Dam Site



Border Dam Site – note extensive rock outcrops in river bed



Border Dam Site from the Air



Mandaya Dam Site from the air, looking downstream



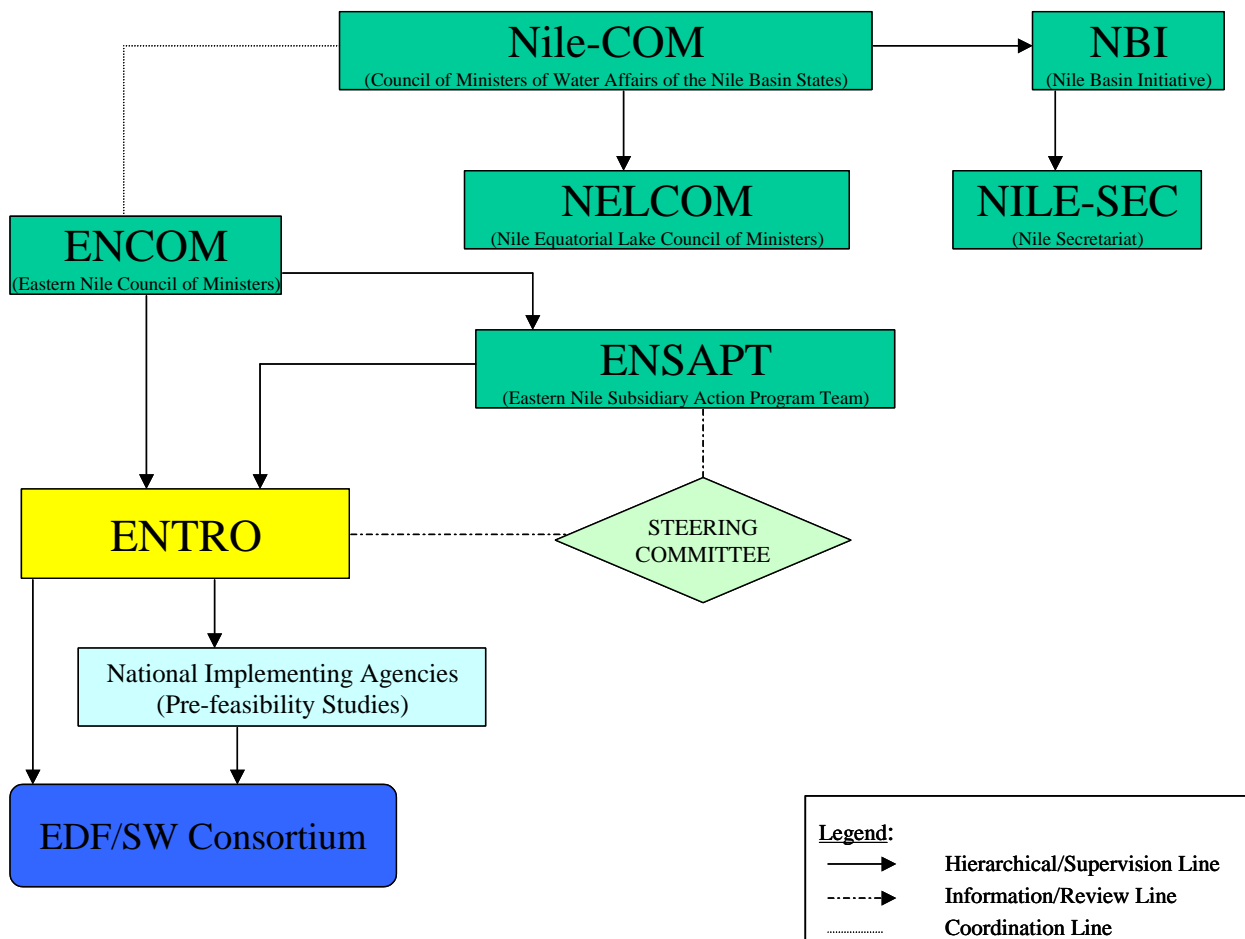
Dal Dam Site looking downstream – note rocky islands of Dal Cataract



Dal Dam Site – note very low topography on West Bank

5. PROJECT ORGANISATION

5.1. ORGANISATION CHART



5.2. WORK PLAN

See Microsoft Project file :

- ENTRO V 10_11_06.mpp

5.3. PROJECT TEAM COMPOSITION

KEY PERSONNEL (INTERNATIONAL)

Name	Position
Pierre BRUN	Project Manager
Christian VILADRICH	Deputy Project Manager - Economics and Power Trade Section Team Leader
Alan BATES	Deputy Project Manager - Power Generation Expert - Hydropower Section Team
Robert LEPORT (to be approved)	Deputy Project Manager - Interconnection Section Team Leader
G�rard MALENGE	Utility Economist Expert
Jean-Fran�ois BALMITGERE	Trading & Cooperation Expert
Alice PEREIRA	Power System Planner
David SURLA	Financial Analyst
Michel CAUBET	Institutional Expert
Patrick JOURDIN	Transmission Engineer Expert
Gwenaelle BONGIOVANI	Static Network Studies
Emmanuel VARRET	Dynamic network Studies
Francis DOS RAMOS	OHL & Substation Senior Engineer
Christophe GUNTZ	OHL & Topography Engineer
Hugues PEROL	Grid Control & Communication Engineer
Andrew WAIN	Environmental Specialist Section Team Leader
Keith THOMASSON	Civil Works Senior Engineer
Edda IVAN-SMITH	Social Specialist
To be named	Geologist
Hany HASSAN	Hydrologist
Pierre-Louis ROSSI	Electromechanics Senior Engineer
Patrick HARTEL	Large Dam Expert

KEY PERSONNEL (LOCAL)

Name	Position
Yahia ABDEL MAGEED	Agriculture Expert, Social, Consultation
Adli ABDEL MAGEED	Local Geologist
Abebe KETEMA	Local Geologist
Sayed AHMED MALIK	Chief Surveyor
John GJNDI BOUTROS	Local Transmission Engineer
Fouad TAHER	Power System Local Expert
Eyob DEFERE DEBREWOK	Power System Local Expert
Wakjira UMETTA	Institutional Local Expert
Azza MAMDOUH KHALIL	Institutional Local Expert
to be named	Environmentalist Local Expert EGYPT
Zelege CHAFAMO SHASHORE	Environmentalist Local Expert ETHIOPIA
to be named	Environmentalist Local Expert SUDAN

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5.4. STAFFING SCHEDULE

		MANNING SCHEDULE PHASE I																	
		2006			2007														
PARTNER	Position	Month												PHASE 1			PHASE 2		
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	on site	HOME	TOTAL	on site	HOME	TOTAL
		nov.	dec.	jan.	febr.	mar.	apr.	may	june	july	aug.	sept.	oct.						
EDF	Project Manager: Pierre BRUN													1,75	3,00	4,75	0,5	0,25	0,75
EDF	Deputy Project Manager: Christian VILADRICH													1,75	3,75	5,50		0,25	0,25
SW	Deputy Project Manager: Alan BATES													1,25	6,25	7,50			0
EDF	Deputy Project Manager: Robert LEPORT													1,25	3,25	4,50	1,25	3,25	4,50
EDF	Utility Economist: Gérard MALENCE													0,75	2,25	3,00		0,50	0,50
EDF	Trading & Cooperation Expert: Jean-Francois BALMITGERE													0,5	0,75	1,25			0
EDF	Power System Planner: Alice PEREIRA													1,75	4,50	6,25			0
EDF	Financial Analyst: David SURLA													0,75	2,25	3,00	0,25	0,50	0,75
EDF	Institutional Expert: Michel CAUBET													0,75	2,75	3,50	0,25	0,25	0,50
EDF	Transmission Engineer Expert: Patrick JOURDIN														0,50	0,50	0,25	1,25	1,50
EDF	Static Network Studies: Gwenaëlle BONGIOVANNI														5,00	5,00			0
EDF	Dynamic network Studies: Emmanuel VARRET													0,75	1,75	2,50	1	3,00	4,00
EDF	OHL & Substation Senior Engineer: Francis DOS RAMOS													0,25	1,00	1,25	0,25	2,00	2,25
EDF	OHL & Topography Engineer: Christophe GUNTZ													1	0,75	1,75	1	1,75	2,75
EDF	Grid Control & Communication Engineer: Hugues PEROL													0,25	0,50	0,75	0,25	0,25	0,50
SW	Environmental Specialist Section Team Leader: Andrew WAIN													2,5	2,00	4,50	1	1,00	2,00
SW	Civil Works Senior Engineer: Keith THOMASSON													2	2,25	4,25			0
SW	Social Specialist: Edda IVAN-SMITH													0,5	2,25	2,75	0,5	1,50	2,00
SW	Geologist: XXXXXXX														2,50	2,50			0
SW	Hydrologist: Hany HASSAN + Pr ROBINSON													1,75	0,50	2,25			0
EDF	Electromechanics Senior Engineer: Pierre-Louis ROSSI													0	1,25	1,25			0
S	Large Dam Expert: Patrick HARTEL													0,25	0,75	1,00			0
S	Agriculture Expert, Social, Consultation: Yahia ABDEL MAGEED													5		5,00			0
S	Local Geologist: SUDAN ???													5		5,00			0
S	Local Geologist: Abebe KETEMA													5		5,00			0
S	Chief Surveyor: Sayed AHMED MALIK													3		3,00			0
S	Local Transmission Engineer: John GJNDI BOUTROS													3		3,00	2		2,00
S	Power System Local Expert: Fouad TAHER													3		3,00			0
S	Power System Local Expert: Eyob Defere DEBREWOK													3		3,00			0
S	Institutional Local Expert: Wakira UMETTA													3		3,00			0
S	Institutional Local Expert: Azza Mamdouh KHALIL													2		2,00			0
S	Environmentalist Local Expert Ethiopia: Zekeke Chafamo SHASHORE													6		2,00	1		0
S	Environmentalist Local Expert Egypt: to be named													2		2,00	1		1,00
S	Environmentalist Local Expert Sudan: to be named													5		5,00	2		2,00
S	Other Specialist: EPS													14		14,00	10,75		10,75
S	Other Specialist: TROPICS													13,5		13,50	12,5		12,50
S	Other Specialist: YAM													6,75		6,75	4		4,00
														99	49,75	144,75	39,75	15,75	54,50
Presence on site of Consultant																			