



ENTRO  
**NILE BASIN INITIATIVE**  
INITIATIVE DU BASSIN DU NIL

# Annual Report

July 2017 – June 2018



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## Acronyms

AF	-	Additional Financing
ANN	-	Artificial Neural Networks
CIWA	-	Cooperation on International Waters in Africa
ECRC	-	Environmental and Climate Research Center
ENCOM	-	Easten Nile Council of Ministers
ENSAPT	-	Eastern Nile Subsidiary Action Program Team
EOI	-	Expresion of Interest
FMT	-	Flood Management Team
ICOLD	-	International Commission on Large Dams
IKP	-	Integratyed Knowledge Portal
MOU	-	Memorandum of Understanding
MPWRS	-	Multi Purpose Water Resources Development Study
MSIOA	-	Multisector Investment Opportunity Analysis
NCORE	-	Nile Cooperation for Results
NMA	-	National Meterological Agency
NWP	-	Numerical Weather Prediction
PCR		Project Completion Report
PFMA	-	Potential Failure Mode Analysis
RFP	-	Request for proposal
RIDM	-	Risk Informed Decision Making
SDCU	-	Social Development and Communication Unit
SIWI	-	Swedish International Water Institute
PIT	-	Project Implementation Team
TWRMP	-	Transboundary Water Resources Management Project

# Executive Summary

1. This Annual Report covers the period July 2017-June 2018 and is prepared on the basis of the NBI Results Based System.
2. Current member countries of ENSAP, i.e. Ethiopia, South Sudan and Sudan have renewed their commitment to sustain Eastern Nile cooperation and ENTRO. This is the most important attribute of the current **internal context** under which ENTRO has operated over the year. Member countries appreciate the long-term significance and value and hence are fully behind the strategic water resources management and development initiatives ENTRO has embarked on such as: *investment Project identification and preparation, capacity building, stakeholder consultation, development communication, dam safety management, coordinated operation of Eastern Nile cascade reservoirs, Knowledge management, internship program, and flood forecasting and early warning systems.*
3. Pertaining to the **external context**, notwithstanding the very fluid and complex hydropolitical and geopolitical backdrop in the Basin, development partners continue extending both financial and technical support to ENSAP/ENTRO. The World Bank undertook the 8<sup>th</sup> Implementation Support Mission to ENTRO; Development partners attended the Baro-Akobo-Sobat Resource Mobilization workshop (organized following the completion of the Project which identified a number of short, medium and long term investment projects for implementation in both South Sudan and Ethiopia). It is also during this period that ENTRO signed contract agreement with GIZ to finance project activities such as water diplomacy, communication, coordinated cascade operation, wetlands, etc.
4. That **two successive governance meetings** i.e. ENCOM 31<sup>st</sup> (ENSAPT 32<sup>nd</sup>) and ENCOM 30<sup>th</sup> (ENSAPT 31<sup>st</sup>) took place during the year are clear demonstrators of Member countries' commitment to pursue the path of Eastern Nile Cooperation. Critical decisions were made pertaining to: clearing of outstanding Country Contribution Arrears (South Sudan has pledged to at least partially clear its arrears of over 1.5 million USD while Sudan and Ethiopia have no outstanding payments); instruction toward developing Resource Mobilization Strategy; approval and adoption of ENTRO 2018-2022 Strategic Plan; approval of ENTRO annual audited financial statement; and decisions on filling ENTRO Senior Management Positions. ENTRO has continued operating under austerity, streamlining operations and doing more with less, leveraging to the maximum the remaining skeletal technical staff by forming Teams to undertake preparation of consultant TORs, review and supervision of consultant reports, etc.
5. Of significance is the submission to and adoption by ENCOM **ENTRO's Strategic Plan (2018-2022)** which was prepared on the basis of the unified NBI 10year Strategy (2017-2027). The strategic plan was prepared completely relying on in-house resources, including undertaking of the requisite consultations with ENTRO Staff, ENSAPT and stakeholders.
6. **In the domain of investment preparation** a key highlight has been the *completion of Baro-Akobo-Sobat Multipurpose Water Resources Development Study Project* which took over two years and came up with a long-term Integrated Water Resources Development Plan (IWRDP) for the sub-basin which was prepared, for the first-time ever, on the basis of a Strategic Social and Environmental Assessment which defined the development space and envelopes, constraining proposed development options, which made tradeoffs between development and conservation more transparent. Downstream, particularly, the short and

medium term investment projects need to be implemented as a matter of urgency toward which countries need to mobilize funding. *ENTRO has also finalized the standalone Eastern Nile MSIOA (Multisector Investment Opportunity Analysis) summary report*, published and distributed to the countries and other key stakeholders. The summary report describes the long-term EN basin challenges as well as opportunities and incorporates national stakeholders' feedback and provides analytical basis for the suggested investment strategy and action plan. Overall, the Study identifies to sets of no-regret programs : a) *program on water resources management* to deepen sub-basin cooperation and increase basin resiliency [viz. coordinated optimal operation of water infrastructure in the basin; environmental and social assessments & safeguards ; water quality, sediment monitoring & management; groundwater monitoring & management; climate change adaptation capabilities; optimization of water resource use for enhancing win-win opportunities; coordination and phasing of win-win EN basin development packages] b) *program to promote cooperative, win-win water resources investment* in the sectors of Power/energy security; watershed management to rehabilitate degraded catchments & improve natural resource-dependent livelihoods; efficient irrigated agriculture; water re-use and salinity management. The Baro-Akobo-Sobat and MSIOA Studies have been undertaken with the proper social and safeguarding (e.g. SSEA) and stakeholder consultations at multiple levels.

Further results related to investment preparation include studies that will eventually inform, or otherwise create the enabling conditions for and determine future investment trajectories in :a) Irrigation system performance assessment in the sub-basin; b) ground water availability assessment in the EN for conjunctive use (with irrigation), including preparation of ground water atlas and data base and c) impact assessment of piloted watershed interventions for selecting and scaling up to catchment level the most viable ones. These studies have been initiated and consultants are being hired.

7. Also in the domain of **institution building and strengthening** worth noting are: the timely conduct of the governance meetings (mentioned above) which took place on time; the completion of the NBI 10-year 2017-2027 Strategy in which ENTRO took active part and completion of ENTRO's own 2018-2022 Strategic Plan prepared on the basis of the basin wide strategy; the completion of NBI Financing strategy which identified 18 key elements; ten capacity building training workshops in various fields such as in potential dam failure analysis, dam surveillance, small dams, flood forecast in which 267 EN participants (235 Male, 32 Female) took place (which also includes training in novel areas such as negotiation and Hydro diplomacy to address EN specific challenges). Another institution building achievement of the period was the successful completion of the 9<sup>th</sup> and 10<sup>th</sup> Internship programs in which ENTRO competitively recruits young professionals in the water sector from universities and ministries in Ethiopia, South Sudan and Sudan. These young professionals, in addition to being exposed to basin wide Nile related planning, management issues and building their capacities, supported ENTRO address its own gaps as well (e.g. in the areas of rainfall and stream flow and flood forecasting for Lake Tana, Blue Nile pars of Sudan, Baro-Akobo-Sobat Sub-basin); dam safety baseline assessment of small dams in the EN, etc.). The Interns also produced the 2017 Flood Season Report, prepared on a 72 hour lead time basis for the 2017 flood season.
8. ENTRO has also been playing active role in fostering **partnership and dialogue** among Nile Basin Stakeholders within and outside the basin. Major highlights include: a) the *5th Nile Basin Development Forum* (NBDF) held in Kigali in October 2017 during which preparation and implementation ENTRO took active part; b) the successfully concluded colorful

*Regional 2018 Nile Day Celebration* held in Addis Ababa which Ethiopia hosted and in which ENTRO expended significant time in the planning, organization and implementation; c) a *resource mobilization* workshop for the Baro Akobo Sobat Study identified projects with Development Partners; d) *the adoption by ICOLD –CDS – International Committee on Large Dams – Subcommittee on Dam Safety – adopted ENTRO’s Dam Safety Guidelines* for its bulletin d) ENTRO has also been successfully collaborating and networking with *UNESCO IHE, IWMI, the World Bank, Sub-basin Authorities within Ethiopia; Eastern Nile Universities* taking part in various meetings and workshops in addition to supporting a number of research on Eastern Nile at *M.Sc. and Ph.D.* levels by researchers from within and outside the basin, including from the *US, Netherlands, Norway, UK, Ethiopia, Sudan, etc.*

9. ENTRO has also been working to enhance its **communication and visibility** during the many basin wide events, including production of program-project specific publications (such as on MSIOA); banners and posters (such as on Nile Day and NBDF); documentaries (e.g. on BAS study), in addition to arranging and leading press conferences during events. ENTRO has also produced podcasts in collaboration with UNESCO-IHE.
  
10. **Sustaining the results achieved** so far is of critical importance. The internship program, thanks to CIWA-AF2 support, will be continued and the next 11<sup>th</sup> batch is under processing. ENTRO’s Dam Safety (EN Small Dam Safety assessment; Dam Surveillance; Potential Failure Mode Analysis-PFMA) and Coordinated Operation of (e.g. development scenarios for coordinated operation) will be completed in the forthcoming year. The downstream activities ensuing from these will be of continued relevance and of sub-basin wide strategic significance benefitting particularly Sudan and Egypt as well as Ethiopia. Collaboration and partnership building with ENTRO’s Stakeholders will be of paramount importance, Thus in the forthcoming year MOU-based collaboration with the University of Manchester (Future DAMS Project), ongoing collaboration with UNESCO IHE and Eastern Nile Universities will be continued. Water Diplomacy, critical as it is, will be pursued further. Next year will be NBI’s 20<sup>th</sup> Year Celebration providing ENTRO and NBI to increase their relevance, showcase their achievements with focused communication campaign. All this said, however, the major justification for ENTRO’s existence is the promotion of cooperative water resources investment, particularly in countries which have suffered significant asymmetries in this regard (viz. South Sudan and Ethiopia). In this regard ENTRO has prepared the MSIOA (the Multisectoral Investment Opportunity Analysis), identifying areas for immediate investment (particularly in the energy, and watershed management sectors). Similarly, the BAS-identified investment projects (short term, medium term and long term) need to be carried forward toward implementation both in South Sudan and Ethiopia. *The non-implementation of identified and prepared projects (at significant outlay) will adversely affect the institutional sustainability of ENTRO in the long run.*
  
11. As pertains to **Annual Budget and Expenditure**, ENTRO’s planned budget was 2, 391, 961 of which NCORE-WB 697,402; BAS-AfDB 444,657; Country Contribution 725,551; GIZ 424,346; EU-GIZ 100,000). Actual expenditure was a total of 1,800, 291 which amounts to 75% utilization. The variance was due to mainly: cost saving from the National Water Diplomacy CB workshops; modification of scope of work for Dam Safety activities; and late budget disbursement for media training and Water diplomacy workshop due to delayed signing of contract Agreement with funder.
  
12. **Challenges encountered and measures taken** during the period include: a) shortage of manpower which has been indicated earlier and is persistent. Under the current operating

environment, ENTRO is striving to do more with less, leveraging and stretching its limited manpower and expertise to the maximum b) the models used for flood seasonal forecasting need to be updated to perform well and use new techniques and models, which in turn require capacity building for the Flood Team. Particularly for South Sudan there is lack of ground-truthing data for the flood prone areas to increase reliability of the forecasts; c) IT infrastructure is outdated and needs replacing with better performing server, workstations, etc. Intermittence of electricity supply (power outage) has been the other challenge d) ENTRO Internship faced challenge getting the right candidates with the relevant experiences that meet the TORs e) increasingly country contribution is becoming a more reliable source of funding for ENSAP. ENCOM 30th has resolved to effect timely clearance of arrears and payment of country contributions. Accordingly, South Sudan committed to partially clear its Country Contribution. However, this commitment is not realized yet, and as of 30th June 2018, ENTRO still expects a total of 1,284,667 USD from South Sudan. ENTRO is working with the RSS to resolve the issue.

# 1. Background

Program Standard Data	
Program Name	Eastern Nile Subsidiary Action Program (ENSAP)
Ongoing Projects	<ul style="list-style-type: none"> <li>▪ Nile Cooperation for Results (NCORE),</li> <li>▪ Baro-Akobo-Sobat Multi-Purpose Water Resources Development Study (Closed, Aug 2017).</li> <li>▪ NBI-Transboundary Water Resources Management project (NBI-TWRMP)</li> </ul>
Program Partners:	<p><b>Owners:</b> The Governments of Egypt, Ethiopia, South Sudan and Sudan</p> <p><b>Development Partners:</b> WB-CIWA, EU-GIZ</p> <p><b>Key Stakeholders:</b> local communities in the EN Basin; relevant government agencies, International Organizations, NGOs, Civil society, private sector, academic and research institutions; media.</p>
Program Duration	Continuous, with individual projects of varying start and closing dates (two to three-years duration on average)
Total Current Year Program Budget	July 2017 to June 2018 is USD 2.39 million
Program Goal and Objectives	
Program Goal	To develop the water resources of the Eastern Nile in sustainable and equitable way to contribute to poverty reduction and to ensure prosperity, security and peace for its entire people.
Program Objectives	<p>Reversal of environmental degradation</p> <p>Promotion of economic growth,</p> <p>Increased regional cooperation and integration</p> <p>Enhanced regional peace and security</p>



## Milestones in the reporting period

- WB Implementation Support Mission to ENTRO, April 2018
- Baro-Akobo-Sobat Multipurpose Water Resources Development Study Project Successfully completed at the end of August 2017
- ENTRO signed contract agreement with GIZ to finance project activities. August 2017 (Water Diplomacy, Dam Safety, etc.)

## Report Background

The Report covers the period July 2017-June 2018. It is prepared in line with the NBI Results-Based Reporting System, which focuses on documenting and communicating key results. Also, the basis for the report is the annual work plan and budget prepared for the period. The report highlights the performance of three ENSAP projects (Baro-Akobo-Sobat Multipurpose Water Resources Development Study, BAS-MWRDS (completed in Aug. 2017), Nile Cooperation for Results, NCORE), NBI-Transboundary Water Resources Management project (NBI-TWRMP) and activities financed by Country Contribution. The Annual Report contains the following sections: background information, internal and external contexts of implementation, program achievements (non financial & financial), major challenges and constraints, mitigation strategies, lessons and recommendations.

## 2. Context as it affected Project implementation

### 2.1 Internal Context

Based on the Baro-Akobo-Sobat Project's lesson, ENTRO established an interdisciplinary Project Implementation Team (PIT) for CIWA AF 2. The team contributed to the improvement of Ground Water Assessment, Irrigation Performance Assessment and Watershed Management Impact Assessment ToRs and for the selection of consultant for the Ground water study. By and large, the team work culture at ENTRO contributed significantly in developing TORs and reviewing project deliverables, facilitating and providing logistical support during capacity building training workshops and in resource mobilization effort. For example, ENTRO team has been providing extensive review of consultant deliverables (Inception report for cascade operation of dams) and the 2<sup>nd</sup> Strategic Plan of ENTRO (2014-2019 Strategic Plan); working together to formulate ENTRO Strategic Plan, 2018-2022 ; developed and reviewed project TORs)

### 2.2 External Context

Technical support provided by development partners, as always, has been invaluable. The status of NCORE planned milestones has been reviewed every six months jointly by World Bank implementation support mission and ENTRO. The 8<sup>th</sup> Implementation support mission was held at ENTRO in April 2017 to discuss on the status of planned milestones. It was crucial to create common understanding on the performances and challenges of the NCORE project. In particular, the CIWA team provided constructive comments to enrich the TORs developed by ENTRO to conduct different studies (Ground Water Assessment, Irrigation Performance Assessment and Watershed Management Impact Assessment, etc.) in the Eastern Nile.

The Roadmaps for dam safety management and cascade dam coordinated reservoirs operation in EN countries are basic for the dam safety component. The Road map for cascade dam coordinated reservoirs operation leads to development of the Cascade dam operation framework. Currently, the preparatory phase is being undertaken. Its objective is to demonstrate the benefit of coordinated operation to the countries which requires water resource and socio-economic data. This demands strong support and commitment from countries. Towards this end, countries gave permission for ENTRO to use the available data at Nile Sec for the cascade coordination preparatory phase study and allowing dam site visit for dam safety PFMA training.

### 3. Actual Results

Below is a summary of major ENTRO-organized events that supported project preparation-implementation work; facilitation of governance oversight and guidance; building national and regional institutions' capacity and supporting the visibility of ENTRO/ENSAP in EN countries. Each event is detailed in the discussion section. A total of 267 participants were involved in these events, 12% of whom were women.

Table 1: Summary of ENTRO Trainings, and Workshops, July 2017-June 2018

S.N	Event	Venue	Date	Gender composition of Participants		
				M	F	Total
1.	Capacity building of Hydro-Diplomacy for Ethiopia	Bishoftu, Ethiopia	August 12-14	20	4	24
2.	Advanced Hydro-Diplomacy Training for Ethiopia's Frontline Negotiation Team,	Bishoftu, Ethiopia	Aug. 24-26	12	2	14
3.	Baro-Akobo-Sobat (BAS) Project and Multi Sector Investment Opportunities Analysis (MSIOA) Study Results Dissemination Workshop.	Juba	August 24-26	58	4	62
4.	Training workshop on Potential Failure Mode Analysis (PFMA), Koka Dam	Adama, Ethiopia	Oct 30 - Nov. 3	20	1	21
5.	Capacity building of Hydro-Diplomacy for Sudan	Khartoum,	Nov 13 -15 <sup>th</sup>	20	2	22
6.	Advanced Hydro-Diplomacy Training for Sudan's Frontline Negotiation Team	Khartoum,	Nov. 16-20	12	1	13
7.	Capacity building of Hydro-Diplomacy for South Sudan	Addis Ababa	December 1-3	17	1	18
8.	Inception Report Review Workshop- Development scenarios for coordinated operation of cascade dams	Bishoftu, Ethiopia	16-17 January	32	4	36
9.	Capacity Building/Strategic Plan retreat of ENTRO staff	Hawassa, Ethiopia	2 <sup>nd</sup> -3 <sup>rd</sup> Feb	26	11	37
10.	Training Workshop on Instrumentation and Surveillance of Dams	Upper Atbara, Sudan	13-15 March	18	2	20
	<b>Total</b>			<b>235</b>	<b>32</b>	<b>267</b>

### 3.1 Results for the Period

#### **Short-term Outcome 1.1: Increased ENSAP cooperative investment projects identified and prepared for implementation**

##### **Eastern Nile Irrigation System Performance Assessment and Options for Improvement:**

Objectives of the study are the following: Develop a knowledge base of the irrigated areas, their water use and the irrigation technology of existing irrigation developments in the Eastern Nile; preliminary assessment of the performance of existing irrigation systems; initiate and inform dialoged on efforts for improvement of irrigation performance; and exchange experience between eastern Nile countries and inform improve irrigation development planning. The activity was delayed associated with some time taken to obtain no objection.

Key activities accomplished include: TORs prepared for the four consultants (one International and one national from each of Ethiopia, South Sudan and Sudan); following no objection from the Bank for the TORs and procurement of the consultant; Expression of Interest announced to invite individual consultants in ENTRO website and thru the news papers in Ethiopia, South Sudan and Sudan. In response to these announcements, expressions of interest were received from adequate number of national and regional consultants. Then, ENTRO team developed Criterion for the selection of regional and national consultants. Currently, the selection process is progressing and expected to sign contract agreement. The assessment is financed from CIWA Additional Financing 2.

##### **Study on Ground Water Availability & Conjunctive Use Assessment in the Eastern Nile:**

The objectives of the study Include: Assessment of the existing knowledge of groundwater resource potential; understand groundwater policies, institutional issues and data & capacity gabs in the EN countries; initiate the establishment of a comprehensive groundwater data base in the EN; production of a preliminary EN ground waters Atlas; harmonize groundwater monitoring practice between EN countries; and initiate future inclusion of groundwater considerations into national and transboundary EN water resources planning. By and large, the assessment is aiming to make preliminary assessment of Ground Water Resources (mapping, recharge and safe yield) and also assess the potential use of ground water for irrigation and domestic uses.

Key activities accomplished: Invitation for expression of interest for four consultants (one international and three national announced thru ENTRO website and in the news papers in each of Ethiopia, South Sudan and Sudan. In response to the announcements, expressions of interest were received from adequate number of International and national consultants. Criterion for the selection of each of the international and national consultants were developed and used for selection; negotiations were then finalized and ENTRO signed contracts with the four individual consultants and some of them have already submitted their first deliverable, inception report. Team of ENTRO experts has been involved actively during the selection process. The assessment is financed from CIWA Additional Financing 2.

### **Impact Assessment of Eastern Nile Watershed Interventions for Scaling up:**

The assessment was designed to address the following objectives. Assess Biophysical Socioeconomic, and Institutional/capacity building impacts of selected project interventions and identify factors accounting for the impact; identify and eventually select most viable best watershed management practices (from ENASP WSM projects and from International experience) for scaling up to larger watersheds across the sub-basins; and develop Regional Watershed Management M&E System and Sediment Management Strategy.

Key activities accomplished during the reporting period include: TORs prepared for three consultants (one regional, and one national from each of Ethiopia and Sudan); Following World Banks' No objection to procure consultants; Expression of Interest (EOI) was advertised thru NBI/ENTRO website and in the news papers of Ethiopia and Sudan. In response to these announcements, expressions of interest were received from adequate number of national and regional consultants. ENTRO team developed criterion for the selection of consultants who show interest to involve in the impact assessment. Currently, selection of consultants is progressing and expected to sign contract agreement. The assessment was delayed associated with some time taken to obtain no objection.

### **Eastern Nile Multi Sector Investment Opportunity Analysis (MSIOA):**

ENTRO finalized the standalone MSIOA summary report, published and distributed to the countries and other key stakeholders. ENTRO team has worked intensely with the Water Resources Planning Unit in getting the study finalized, and the summary report published. The summary report describes about the EN basin challenges and opportunities and also key messages from the whole MSIOA study. It incorporates new aspects including stakeholders' feedback and provides analytical basis for the suggested investment strategy and action plan, which are used to prepare the following concept notes to support ENTRO and the countries to mobilize financial resources;

#### **Program 1: Water Resource Planning/Management: management, increase cooperation, and increase resiliency**

- EN coordinated Optimal operation of infrastructure

- Environmental and social assessments & safeguards
- Water quality, sediment monitoring & management
- Groundwater monitoring & management
- Climate change adaptation capabilities
- Optimization of water resource use for enhancing win-win opportunities
- Coordination and phasing of win-win EN basin development packages

**Program 2: Water Resource Investment**

- EN Power/energy security
- Watershed management to rehabilitate degraded catchments & improve natural resource-dependent livelihoods
- Efficient irrigated agriculture
- Water re-use and salinity management

**Baro-Akobo-Sobat Multipurpose Water Resources Development Study:** ENTRO PIT has provided comments on the final submissions of the Consultant Reports. Accordingly, the BAS project study deliverables had been finalized and disseminated to the countries and African Development Bank. The deliverables include the following.

➤ **The Integrated Water Resources Development and Management Plan**

- Inception report, Consultation and Communication Plan, Scoping report, Baseline, Development Potentials, Key issues and Objectives report, Strategic Social and Environmental Assessment and Integrated Water Resources Development and Management Plan

➤ **Medium and Long Term Projects: Terms of references for feasibility studies**

The Integrated BAS Hydropower, Irrigation and Multipurpose Development Program - Phase 1. Baro-Sobat component; The Akobo-Pibor Transboundary Multipurpose Development Project; and Livelihood-based Watershed Management - Taking to Scale for a Basin Wide Impact

➤ **Short Term Project: Feasibility studies**

Feasibility Study for the Kinyeti River Multipurpose Development Project; Feasibility Study for the Majang Multipurpose Project; and Design Details for the Akobo-Gambella floodplains Transboundary Development Program

➤ **Project brochures**

The Baro-Akobo-Sobat Multipurpose Water Resources Development Study Project: General overview and Baro-Akobo-Sobat Multipurpose Water Resources Development Study Project: Medium and Long Term Projects

There is a need for continuous resource mobilization by ENTRO and the Countries for the implementation of the investment ready projects to change the socio-economic and environmental condition of the people in the BAS sub-basin areas.

**BAS Project Completion Report (PCR) prepared:** The BAS project was successfully completed in August 2017. Chief among others, the PCR discusses thoroughly about the project objectives and components, project management issues, deliverables, resources

mobilization, the countries commitment during the project study and consultation workshops, key challenges encountered, lessons learned and key recommendations for future action.

### **Short-term Outcome 1.2: Increased integration of social development and environmental dimensions in ENSAP projects**

**Baro-Akobo-Sobat Multipurpose Water Resources Development Plan:** ENTRO has provided comments on the final submissions of the Consultant Reports, particularly by pointing out the need to enhance the social dimension (viz. spatial dimension of livelihood such as pastoralist migration routes; seasonal watering places; resource based conflicts such as pastures in addition to the Documentary preparation Consultant, mentioned above, which would have been a great asset in stakeholder consultation, if completed at the suggested level and content.

**Participation in the EWNHS (Ethiopian Wildlife and Natural History Society) organized wetland workshop:** ENTRO will undertake the GIZ-EU supported Nile Basin wetlands study on the Machar Marshes. In anticipation of this ENTRO SDCU Head, along with the Water Resources Senior Expert and Senior Project Coordinator, took part in this one-day workshop and made contributions, though Machar marshes was not the central question of the study

### **Short-term Outcome 1.3 Financial and institutional arrangements established among EN Countries for prepared ENSAP projects**

**NBI Financing Strategy (2017-2022):** SDCU Head took active part in the 3-center formulation of a financing strategy to accompany the NBI 10-year strategy, which the 3 centers have to tailor-make to suit their specific circumstances. The Financing Strategy assessed the reliability and adequacy of current country contributions, including trends; income generation and cost effective investments preparation; enhancing program funding; resource mobilization and action plan and role of governance. About 18 Strategy elements were defined that outlined ways to increase or otherwise sustain core cost funding; program funding; investment preparation funding; investment (implementation) financing

### **Short-term Outcome 2.1 Enhanced ENSAP Image in NBI and EN countries**

**Regional Nile Day Celebration, February 22, 2018, Addis Ababa, Ethiopia**

A major activity during this reporting period has been preparation of the 2018 Regional Nile Day Celebration which Ethiopia hosted and in which ENTRO had to take the lead in coordinating the organization with the NBI/Nile-Sec, on the one hand, and the FDRE Ministry of Water, Irrigation and Energy, representing the Host Country and Government, on the other.

At Regional Level, ENTRO contributed the definition of the theme of the Celebration **“Shared River, Collective Action”** which shed light on the challenges and prospects of Nile Basin cooperation from the vantage of Collective Action – a concept in the commons management discourse- which highlights the hurdles that need to be overcome to keep a common pool resource, such as transboundary rivers, in a state that is sustainable for future generations.

As member of the communication Team, ENTRO was responsible for communication before, during and after the event. ENTRO produced a six-page briefing to Media Houses in Ethiopia on covering the Event. ENTRO helped in the design and production of Event Brochure, t-Shirts, caps, Banners, Logos for the event. The afternoon session highlight was the Nile Day Symposium which was attended by Ministers, dignitaries and Nile experts. ENTRO took part in formulating the theme of the Symposium, which was deemed very relevant and burning. The Theme read: **“Towards Effective Nile Cooperation: Exploring Options for enhanced Political engagement”**. ENTRO was responsible for preparing summary of key issues, convergence points and key messages by way of concluding the symposium. The symposium was opened as well as closed by the Ethiopian Minister of Water, Irrigation and Energy. The Nile Day Celebration, apart from being colorful, also addressed critical issues.

The event had extensive media coverage especially by journalists from Nile Basin countries who were specially invited for a GIZ-funded training program intentionally organized back-to-back with Nile Day Celebrations.

#### **Communication Products:**

- **NBI Corporate Report:** ENTRO has contributed to the production of the 2017 NBI Corporate Report by providing ENSAP related data and information.
- **ENMSIOA Summary Report:** As co-editor (along with the Senior WR Specialist) of the ENMSIOA Summary Report 2017, SDCU has made editorial and revision contributions.

**Participation in the formulation of NBI State of the Basin II Report:** ENTRO took part in this activity which will commission the production of the Second State of the Nile Basin Report.

**NBI Communication Strategy:** ENTRO took part in the formulation of NBI communication and stakeholder involvement strategy to accompany the NBI 10 year (1017-1027) Basin Strategy. ENTRO supported the formulation of key messages for each of the six Goals of the Strategy (water security, energy security, food security, environment, basin cooperation and climate change). The Communication strategy focuses on correcting the narratives about Nile Basin issues, including cooperation, water resources management emphasizing on the dissemination of NBI knowledge products thru on line, events and media relations

and such platforms as symposiums and workshops tied to Nile Basin Discourse Forum, Regional Nile Day Celebrations. These eventually are being translated and inputted into the ENSAP communication activities, which will orient and frame them into project preparation and related studies.

**Skype Interview to a primary School in Cairo:** ENTRO provided a live interview to some 20 students (German School in Cairo) in which ENTRO replied, clarified to questions raised pertaining to Eastern Nile – what does basin cooperation mean, why it is needed; why we cannot do without it; common interests and shared responsibilities about the Nile; why Egypt, Ethiopia, South Sudan and Sudan need to go beyond Nile waters and develop a common regional market that ties the countries together economically as well, etc.

**Podcast on NBI and ENTRO experience on media and communication:** ENTRO made a podcast presentation for broadcast on the internet about “who speaks for the Nile”; our communication targets; objectives of communication; challenges we face in reaching our targets and the influences we make; about the limits of the water war frame (and the need and urgency for alternative narrative) about how science and technical knowledge is contributing to the emergence of new narrative (or lack thereof).

**10<sup>th</sup> Batch ENTRO Internship:** ENTRO has been in search of Young Professional Communication Interns to mentor. SDCU collected six potential candidates’ resumes, Skype-interviewed and selected a Sudanese lady and an Ethiopian gentlemen for a 3-month internship during which ENTRO invested significant time doing the show-how. One of them will be retained to help address the manpower deficit at Social Development and Communication Unit. ENTRO has sought funding from GIZ and obtained same to retain the staff.

**NBI New Website Design:** ENTRO took part in a 3-day 3-center workshop to specify user requirements for the website design. ENTRO also provided inputs to NBI corporate design of written products.

### **Eastern Nile - Knowledge Enhancement:**

Its objective is to avoid challenges because of the fragmented databases thru creating easily accessible data, information and knowledge products which need to be linked with all NBI centers through the development of integrated knowledge portal. It has three components (Comp 1- Enhancing ENTRO Knowledge base; Comp 2 – Integrated Knowledge Portal; and Comp 3 Capacity Building).

Under component 1 (Enhancing ENTRO Knowledge base), ENTRO prepared TOR for three regional and international individual consultants (Database developer, Communication /Documentation Expert and Visualization Expert) and submitted to the World Bank requesting for no objection. Regarding component 2 (Integrated Knowledge Portal), ENTRO and Nile-Sec signed MOU to collaborate for the development of Integrated Knowledge Portal (IKP). The three NBI centers met in Entebbe to work on requirement and developed TOR for the IKP. Following no objection and approval from the Bank, ENTRO announced to collect Expression of Interest (EIO) from various firms to develop the IKP. The IKP working group met in Addis Ababa to shortlist firms which pass RFP and the list

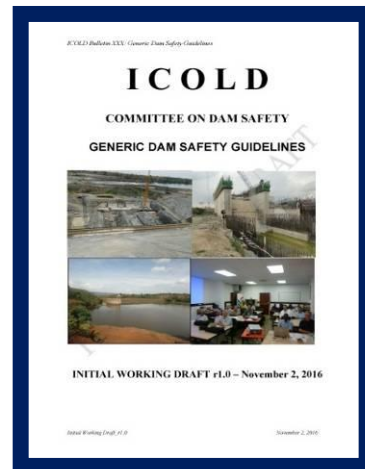


have been submitted to the Bank and waiting for no objection to go ahead. For component 3 (Capacity Building), procuring some IT related goods are in progress.

**Work on the draft ICOLD bulletin on Generic Dam safety guidelines (Initiated by ENTRO) in collaboration with ICOLD-CDS (Committee on dam safety).**

Currently, ICOLD has 26 Technical Committees that address technical issues related to the development and management of dams. Committee on dam safety (CODS) is one of these technical committees which has representatives from 35 countries.

On Tuesday 4 July, 2017, the draft Dam Safety Guidelines, adapted from ENTRO's Guidelines, was presented to these committee members. The meeting was attended by 25 members, 5 invited guests and 21 observers. The committee members provided valuable inputs to enrich the documents and also suggested to disseminate the amended draft documents for members of CODS and national committee for further detail review and comments. At present, the document is being reviewed by national committee and CODS and will be discussed in the upcoming ICOLD-2018 Vienna conference.



**Baro-Akobo-Sobat – Multipurpose Water Resources Development Study – Documentary:**

Led by SDCU, BAS project Implementation team (PIT) held in-depth discussion about BAS project Documentary preparation and that ENTRO has built significant experience in this line of work. Demonstrating this by ENTRO documentaries on “Watershed Management Project Documentary Part 1- Ethiopia and Part 2- Sudan”; on “Climate Change”, “stakeholder involvement in the JMP Studies”, the team emphasized that this BAS documentary is extremely important in many terms: as a resource mobilization tool; as awareness and educational material; as ENSAP/ENTRO regional cooperation profiling medium, etc.

ENTRO hired a consultant and undertook a field trip to the BAS region and kindly provided the first-cut (of the documentary part on Ethiopia) to the ENTRO-SDCU. The Unit provided a written comment on the first-cut of the documentary (highlighting the major shortcomings that needed to be remedied) and requested the BAS RPC to organize a face-to-face meeting with the consultant before the final is released. Finally, the BAS project documentaries (in Ethiopia and South Sudan) finalized and disseminated to countries.

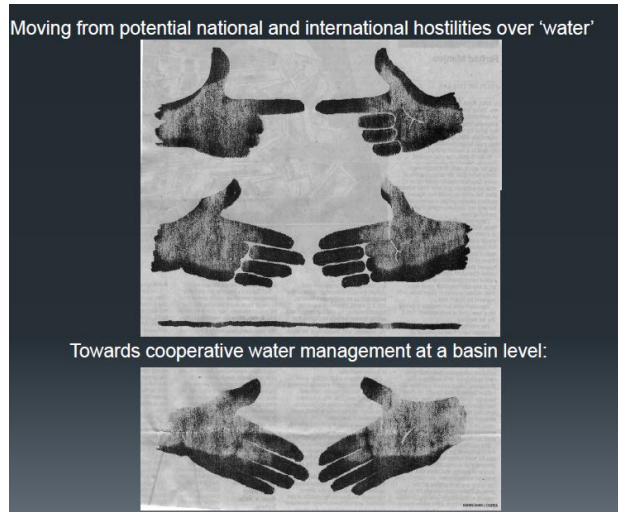
**Short-term Outcome 2.1: Increased ENSAP dialogue and partnership with government, civil society, local communities, private sector and development partners**

**Capacity building workshop of Hydro-Diplomacy for South Sudan, 1<sup>st</sup> -3<sup>rd</sup> December, Addis Ababa**

The main objectives of the workshop were to: Stimulate the South-Sudanese Negotiation Team to develop their own negotiating and conflict resolution capacity on water related disputes; enhance the individual negotiator ability in his/her field of responsibility to reach sustainable solutions, especially related to water disputes; and to assist South-Sudan and in building a strong negotiating team and thereby increase its negotiating power and efficiency for cooperation of ENB challenges and conflicts.

*The Workshop focused on the following themes: Challenges and problems related to management of regional and national water resources and environment, generally and specifically; some up-to-date negotiation theory and practice were briefly outlined; the challenges in development of a negotiation strategy; discussion of Lessons Learned for other national and international water negotiations, and how could that experience be related to the regional setting; critical assessment of conflicts: The notion of “Red Teaming”; and development of negotiation options more specifically: Scenario planning, confidence-building visits, verification and assurance systems, creating a forum for dialogues.*

A total of 17 participants attended the training workshop. Of whom, 6% were female.



**Capacity Building workshop of Hydro-Diplomacy for Ethiopia, 12<sup>th</sup>-19<sup>th</sup> Aug. 2017, Bishoftu, Ethiopia:** The main objectives of the training workshop include the following: Stimulate the Ethiopian Negotiation Team to develop their own negotiating and conflict resolution capacity on water related disputes; Enhance the individual negotiator ability in his/her field of responsibility to reach sustainable solutions, especially related to water

disputes; and Furthermore, it aimed to assist Ethiopia in building a strong negotiating team and thereby increase its negotiating power and efficiency for cooperation of NB challenges and conflicts.

**The Workshop focused on the following themes:**

- Challenges and problems related to management of regional and national water resources and environment, generally and specifically.
- Some up-to-date *negotiation theory and practice* were briefly outlined.
- More importantly, however, were the challenges in development of a negotiation strategy, and to answer questions like how to:
  - Translate rhetoric and policy into an operational negotiation strategy?
  - Prepare for a negotiation, and set up a negotiating team?
  - Conduct and close a negotiation?
- Another important theme was discussion of *Lessons Learned* for other national and international water negotiations, and how could that experience be related to the regional setting.
- Critical assessment of conflicts: The notion of “Red Teaming”
- A major focus was put on *development of negotiation options*; more specifically: Scenario planning, confidence-building visits, verification and assurance systems, creating a forum for dialogues.



Finally, the participants were filmed in an interview session (which received unison positive feedback) –in the concept of “Public Hydro Diplomacy”.

The fundamentals of negotiation techniques, the search for win-win outcomes, defining own interests, understanding the others’ motivations (in contrast to positions) were provided. This training will provide input in the design of forthcoming ENTRO organized water diplomacy workshops. A total of 24 participants attended the training workshop. Of whom, 17% were female.

**Capacity building workshop of Hydro-Diplomacy for Sudan, 13<sup>th</sup> -24<sup>th</sup> November 2016, Khartoum, Sudan):**

The main objectives of the Training workshop were to: Stimulate the Sudanese Negotiation Team to develop their own negotiating and conflict resolution capacity on water related disputes; enhance the individual negotiator ability in his/her field of responsibility to reach sustainable solutions, especially related to water disputes; and furthermore, it aimed to assist Sudan and in building a strong negotiating team and thereby increase its negotiating power and efficiency for cooperation of ENB challenges and conflicts.

**The training workshop focused on the following themes:**

➤ Challenges and problems related to management of regional and national water resources and environment, generally and specifically.

➤ Some up-to-date *negotiation theory and practice* were briefly outlined.

➤ More importantly, however, were the challenges in

development of a negotiation strategy, and to answer questions like how to:

- Translate rhetoric and policy into an operational negotiation strategy?
- Prepare for a negotiation, and set up a negotiating team?
- Conduct and close a negotiation?

➤ Another important theme was discussion of Lessons Learned for other national and international water negotiations, and how could that experience be related to the regional setting.

➤ Critical assessment of conflicts: The notion of “Red Teaming”

➤ A major focus was put on *development of negotiation options*; more specifically: Scenario planning, confidence-building visits, verification and assurance systems, creating a forum for dialogues.

➤ Finally, the participants were filmed in an interview session (which received unison positive feedback) –in the concept of “Public Hydro Diplomacy”.

A total of 22 participants attended the training workshop. Of whom, 9% were female.



**5<sup>th</sup> NBDF (Nile Basin Development Forum) Preparation and Implementation (23<sup>rd</sup> - 25<sup>th</sup> October 2017, Kigali, Rwanda):** ENTRO as member of the Regional Technical Organization Team of the 5<sup>th</sup> NBDF which was held in Kigali, Rwanda, has been taking part in prior Meetings during which such things as the overall theme, date, deadlines, etc. were



determined. This meeting was the last before the actual event during which the nuts and bolts of the Conference were worked out such as the story line, clustering's, determination of panel and synthesis sessions, precise locations, times, speakers, venues/halls, moderators, rapporteurs, session briefing notes, Guideline for Session Rapporteurs and Moderators etc.

In addition to following up the technical conduct of the Conference, ENTRO was the Chief Rapporteur of the Conference. ENTRO developed guidelines for session note takers to capture key points; produced information notes on sessions and speakers, briefed moderators on salient issues to consider particularly in the High level panel sessions. As Rapporteur for Plenary Session 2 (Coordinated Planning and Management of Shared Water Resources for enhancing water security in the Nile Basin) and Rapporteur for Synthesis Panel Session (How to take forward) and that of the High Level (Ministerial) Panel, ENTRO produced a number of summary reports on results of the Conference, drafted and submitted Conference Statement for incorporation in the Conference Report and delivered the Key Message at the Closing Session. In addition, ENTRO presented on Eastern Nile Flood Preparedness and Early Warning; Eastern Nile Multi-Sectoral Investment Opportunity Analysis; and Eastern Nile Multi option scoping model (ENMOS).

**NBI-DP Strategic Dialogue:** ENTRO contributed, providing background documents and preparation of ENTRO Brief to the session, to the preparation of this meeting which took place on 26<sup>th</sup> October 2017 in Kigali back-to-back arrangement with the 5<sup>th</sup> NBDF.

**ENTRO-DP Resource Mobilization Consultation Meeting:** ENTRO has been extending support in the organization of this workshop. Power point Key pointers were prepared which succinctly argued why BAS MPWRD Study Project produced Integrated Water Resources Development and Management plan along with short-, medium and long-term projects matter for the international community, and why funding these projects will have not only economic, but also regional security contributions as well.

### **Development scenarios for coordinated operation of cascade of dams in the Eastern Nile, Inception Report Review Workshop**

The overarching objective was to demonstrate how to maximize the benefits of coordinated operation rules of cascade dams in the EN. A two day workshop to review the inception report was held from 16<sup>th</sup> -17<sup>th</sup> January 2018 in Bishoftu, Ethiopia.

The Consultant presented his approach (methodology, plan) to undertake the assignment. This work constitutes part of the Second Phase of the Nile-Sec led Strategic Water Resources Analysis of the Nile Basin. The ultimate goal of this study is to quantify the strategic plan (scenario) for coordinated operation of existing and planned dams in the Eastern Nile. The consultant concluded by putting forth Open Questions (on key parameters of the study both for baseline and cascade dam operation scenarios which included: Water resources system flow network; Time series; Dams ; Operating rules; River reaches; Cascade dam operation scenarios). ENTRO summarized the discussion at the end of the Workshop and identified key agreed upon issues for the way forward.



A total of 36 experts attended this workshop (32 Male and 4 Female). The participants were ENSAPT members, Head/Directors of Hydrology and Reservoir operation department/directorate in the Eastern Nile, National Experts Group members for strategic water resources analysis, Experts responsible/working on reservoir operation. They were drawn from Ethiopia, South Sudan, Sudan, ENTRO, Interns (young professionals), Nile Sec., GIZ, and NELSAP-CU.

### **Baro-Akobo-Sobat (BAS) Project and Multi Sector Investment Opportunities Analysis (MSIOA) Study Results Dissemination Workshop 24-26 August 2017 - Juba, South Sudan:**

ENTRO organized dissemination workshop from 24<sup>th</sup>-26<sup>th</sup> August 2017, Juba, South Sudan during which representatives from: Ministries, States, Local Governments, Universities, UNESCO, Media and ENTRO took part. The objective was to mobilize resources for the Implementation of short term prepared projects and for preparation of medium and long term projects in the BAS sub basin



and MSIOA identified projects. ENTRO Project Implementation Team (PIT) has supported the resource mobilization effort for the implementation of the identified short, medium and long term projects. A total of 62 participants attended the dissemination workshop. Power Point Key pointers were prepared which succinctly argued why BAS MPWRD plan along with short-, medium and long-term projects matter for the international community, and why funding these projects will have not only economic, but also regional security contributions as well.

**ICOLD Cconference:** An article titled “Eastern Nile transboundary cascade dams: Spillway design flood estimation techniques and selection criteria” was prepared and submitted to ICOLD, for its 2017 symposium, which took place in Prague, Czech Republic, from 3<sup>rd</sup>-7<sup>th</sup> July 2017. ENTRO Dam Safety Coordinator participated in the workshop and made presentation. The objective of ENTRO presentation was to share Eastern Nile experience to the international community and learn from their feedback.



**ICOLD Technical Committee meeting:** Currently ICOLD has 26 Technical Committees that address current technical issues related to the development and management of dams. The committee on dam safety (COD) which is one of the technical committees has representatives from 35 countries.

On Tuesday 4<sup>th</sup> July 2017, the ICOLD draft Dam Safety Guidelines, which has been adapted from ENTRO Guidelines, bulletins was presented to this committee. The meeting was attended by 25 members, 5 invited guests and 21 observers. The committee members provided valuable inputs to enrich the documents and also suggested to disseminate the draft documents to National Committee members for further review and comments.

**Stakeholder consultation on Dam Safety issues:** The Committee on Dam safety with the working group presented draft documents focusing on “Development of a dam safety regulatory framework” and “Development of generic dam safety guidelines” to wider stakeholders. Both documents aim at providing assistance and guidance for developing legal and regulatory frameworks for dam safety. On the other hand, the research team from the University of South Australia provided summary of the World Bank Global Comparative Dam Safety Study. The Study is focused on legal and regulatory arrangements for dam safety in 51 countries representing all stages of economic development as well as on practical arrangements for organization and management of dam safety programs.

**SANCOLD Workshop on Dam Safety:** The South African National Committee on Large dams (SANCOLD) organized a workshop on dam safety from 15<sup>th</sup> -17th November 2017 in Pretoria, South Africa.

The topic of the Workshop was on dam safety issues associated with the concerns about the aging dam population, and the aging and diminishing group of Approved Professional Engineers. South Africa has managing the safety of more than 4000 dams. ENTRO Dam Safety coordinator presented Eastern Nile experience on dam safety management.



### **Collaboration and Partnership:**

**Support to Ph.D. and M.Sc. Research:** ENTRO accepted and provided information and guidance to five M.Sc. and Ph.D. doing research on the Nile (law, international relations-hydro diplomacy, eco-hydrology, stakeholder participation; actor networks). The value addition of this support to research is both short and long term – the creation of robust knowledge base and factual information that will influence the evolution of culture of informed, deliberative transboundary water resources management and development related decision making (both policy and programmatic).

**UNESCO-IHE:** It is to be recalled that ENTRO has signed MoU with this institute. ENTRO supported the development of a training brief on building capacity of scientists doing research on water issues to engage with the media in order to effectively communicate their work. Subject matter included: how to work with the media; making science interesting to journalists; simplifying the science; packaging statistics for lay persons; how to talk to the press, how to write a press release; communication science amidst war drums; designing and implementing communication strategy, etc.

**ECRC:** Collaboration with Environment and Climate Research Center (ECRC) thru sharing experiences of FFEW with their project “Drivers of Flood Risk in the Awash Basin and Opportunities for Adaptation”. ENTRO contributed in sharing the experience of the Flood forecast activity in the Nile basin.

**Sub Basin Authorities:** To support challenges of the EN countries, ENTRO made an effort to strengthen partnership with sub basin Authorities i.e. Abbay Sub basin Authority by conducting a field visit to Lake Tana to see the challenge of water Hyacinth and propose any possible support from ETNRO in preparation of proposal for resource mobilization

**World Bank:** ENTRO has been working with the World Bank to support some of the activities of NCOE in the following areas: Work with Cloud – to – Street :To develop a Flood Risk Dashboard for EN; prepare a story line of ENTRO experience in Young professionals; and assess ways of packaging tools on how to develop eBook, web applications, etc.

**Non-Profit Research Institute:** ENTRO has been collaborating with a non-profit research institute to apply for funding by IDRC “Cultivate Africa's Future Phase II” in the area of *“Improving Irrigation Water Productivity through an Irrigation Information Management System for the Eastern Nile Region”*.

**University of Manchester:** ENTRO supported the identification of areas of collaboration with the University on its Future Dams research in Eastern Africa. ENTRO participated in the identification of specific areas, tasks and modalities, to be inputted into the working out of the Memorandum of Understanding.

**Knowledge Exchange Study Visit to ZAMCOM:** ENTRO took part in this Study Exchange visit co-organized by GIZ, SIWI and ZAMCOM in which several participants from other African Sub-basins took part. This is the third of such knowledge and exchange study (the first was on basin planning, the second on environmental planning and this one on cooperative basin management in the SADC region- strategic, legal and institutional perspectives).

### **Short-term Outcome 3.1: Stronger EN institutional architecture at national level to identify, prepare and implement cooperative developments**

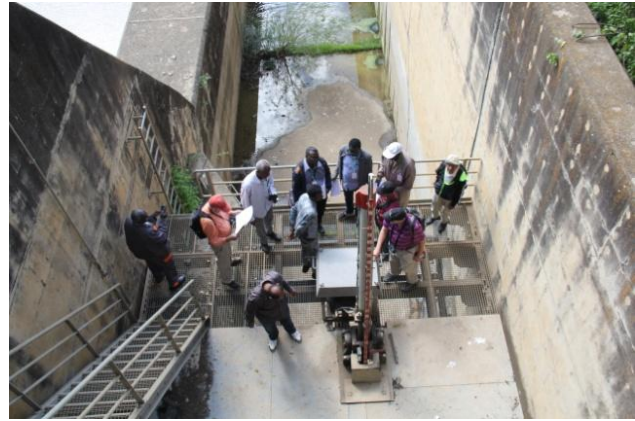
#### **Potential Failure Mode Analysis (PFMA) Training workshop, Koka Dam:**

The training was conducted on Koka concrete dam from 30<sup>th</sup> October to 3<sup>rd</sup> November 2017 in Adama, Ethiopia. The objectives of the training workshop were to: provide participants basic knowledge, concept and application of Potential failure mode Analysis (PFMA) on concrete dam and Risk Informed Decision Making (RIDM) process; apply the PFMA procedure on Koka Dam and train national experts to be





able to subsequently perform PFMA on dams in their own countries and enhance capability and competence to assess dam safety at national level. A report has been prepared according to the provisions of the “Reference Dam Safety Guidelines for Eastern Nile Countries” published by ENTRO in December 2014. This report presents the results of a “Demonstration Potential Failure Modes Analysis” on Koka Dam. The PFMA methodology can be applied to other dams in the Eastern Nile (EN) Basin to provide input to the management of dam safety. A risk matrix approach was used to prioritize each potential failure mode according to broad categories of failure likelihood and consequences. During the course of analyzing and classifying the potential failure modes, a lot was learned about the dam and its ability to withstand future loading, as well as the potential for risk reduction, monitoring, and existing data gaps. A total of 21 participants attended the five days training workshop.



### ***Training Workshop on Instrumentation and Surveillance of Dams***

The overarching objective of the training was to sustain the key achievements made in the previous NCORE-CIWA program and putting strong national institutional setup in place to properly operate and manage complex and transboundary dams in the Eastern Nile.

The specific objective of this training was to provide hands on training on Instrumentation and Surveillance of dams in general and embankment dams in particular. This enhances the technical capacity of Eastern Nile dam safety experts and to keep up to date on instrumentation and monitoring technologies.

The classroom training was accompanied by a site visit to the Upper Atbara complex which comprises of Rumela dam on Atbara River and Burdana dam on Setit River and Kashim El-Girba dam on Atbara River in Sudan. It was intended to illustrate the application of instrumentation and surveillance monitoring and interpretation process on existing dams.



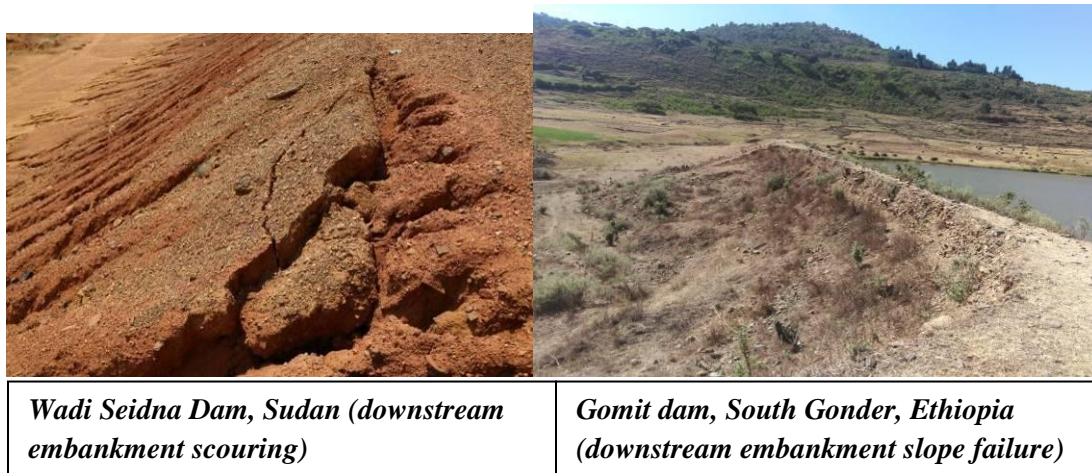
A three day training workshop was held from 13<sup>th</sup> -15<sup>th</sup> March 2018 in Sudan. A total of 18 experts attended the program. The target trainees were dam operators, particularly for Inspectors responsible for data recording, monitoring and interpreting instrumentation

data. The Training Report was disseminated to the countries. It was undertaken as per the plan.

***Development of Eastern Nile small dams’ baseline information and Safety Assessment***

Small dams have been constructed and being operational in the EN counties in the last fifty years. They have been serving as water storage reservoir for supplementing rain-fed agriculture (using small scale irrigation), micro-hydroelectric generation, for recharging groundwater, as drinking water supply storage, and others. Unfortunately, these dams have not been properly recorded and monitored about their performance and safety according to the current state of the art technology. Taking this into consideration, ENTRO has initiated to develop baseline data and assess their current situation in terms of design, construction, operation and safety standards. Two young professionals from Ethiopia and Sudan were assigned to undertake this assignment. In Parallel, one Intern from South Sudan was assigned to develop a Hydrological Design Guideline for small dams.

The Interns reviewed available documents in ENTRO and travelled to Ethiopia and Sudan for ten days field work and submitted the following reports. The reports are very helpful to visualize the current small dam design, construction and operation practices and related issues, including organizational arrangement in Eastern Nile countries.



**Eastern Nile Seasonal forecasting/Flood Forecasting and Early Warning** – Its main objective is to expand and enhance flood and river forecasting and early warning system in the Eastern Nile Basin. It has the following three components: Comp 1- Enhancing Flood Forecast System; Comp 2 – Seasonal River Flow Forecast; and Comp 3 Capacity Building.

Under Comp 1- Enhancing Flood Forecast System, separate TOR have been developed for this component and submitted for no objection to the Bank and has got approval. Following this, ENTRO prepared the TOR for the team leader and hired the consultant. Preparing a TOR for individual consultant who will be responsible for modeling, surveying, remote sensing and flash flood study is also progressing. Currently, ENTRO is doing the preparatory work to conduct Flood Forum aiming to create a platform where by Eastern Nile countries learn from regional and international experiences in developing a robust system for forecasting; data and information exchange; flood coping mechanisms; better flood management, etc...

Regarding Comp 2 – Seasonal River Flow Forecast, ENTRO is working together with Nile-Sec in developing the TOR for individual consultant to conduct the seasonal forecast study. For Comp 3 Capacity Building, procurement is under process for a server and workstations that can be used for flood management team.

**Internship and Young Professional Program** – its objective is to fill knowledge gaps by producing and developing models, analytical tools and generating information materials. To lead the internship program, ENTRO hired an internship coordinator from the former ENTRO interns.

**9<sup>th</sup> batch Internship Program:** The objective is to sustain the internship program and continue producing information, models, analytical tools and toolkits to enhance the knowledge base of ENTRO and EN countries. The 9<sup>th</sup> batch consisted of six interns; two from each country (Ethiopia – South Sudan– Sudan). It was a three months program (December 2017 - February 2018). The interns have been divided into two activity areas as depicted below:

**Team 1: Stream Flow forecasting:**

This team includes the interns who came from academic background (Juba, Khartoum and Addis Ababa Universities). They had been working in Stream flow forecasting for three Eastern Nile sub basins; Baro-Akobo-Sobat, Tekeze and Blue Nile. After reviewing seasonal flow forecasting methods (Statistical method, Soil moisture index model, Simplified stage-forecasting methods, Conceptual stream flow model using Empirical methods and Ensemble Approaches), the team have compared different forecasting model performance and recommend the “Artificial Neural Networks (ANN)” is more suitable for Easter Nile basin.

*Activities and deliverables include:* Literature review on the available flow forecasting methodologies; preparation of input data for forecast model; develop forecast model for selected location in the basin; comparison of forecast models i.e. PCR, PLSR, ARIMA and BJP and ANN flow forecasting methods; use the selected models “Artificial Neural Networks (ANN)” to predict the flow for the entire EN to predict flow at different Eastern Nile sub basins based on available precipitation and temperature forecasts; and report on different forecast approaches.

**Team 2: Dam Safety baseline assessment for Small Dams:**

This group includes the interns who came from professional background and working in one of the three Ministries (Ethiopia – South Sudan– Sudan). This group was focusing on Eastern Nile small dams – collecting and analyzing baseline information on design, construction, operation and safety managements. For the purpose of the studies, 17 Ethiopian and Sudanese dams have been visited by the interns.

The main output for this group is the Hydrologic Design Guideline for Small Dams in the Eastern Nile and two detailed reports on the current safety of small dams in Ethiopia and Sudan.

*Activities and deliverables include:* Detailed Literature review on different approach to assess small dam safety and design standards; field visit to Ethiopia and Sudan on selected sites of small dams to consult with stakeholders and collect information (general

information, key dam safety characteristics, identify potential downstream consequences, and surveillance and monitoring of construction and operational behaviour); analyse the collected data and information to prepare report; develop a “Hydrologic Design Guideline for Small Dams in Eastern Nile”; and inventory detailed data for the 17 visited dams.

Key findings include: Lack of ownership (this problem has been identified in both; Sudanese and Ethiopian dams); management issues like: Absence of Regular check up and maintenances; unavailability of design documents; technical issues; Excessive sedimentation, Vegetation growth on slopes, malfunction of controlling gates (leakage), Cracks on Guide walls of spillway and deep sluice, blockage of outlet structures, Seepage at different locations of dam body and abutments, Excessive embankment slope vegetation and erosion.

**10<sup>th</sup> batch of Internship-** The 10<sup>th</sup> batch started since 1<sup>st</sup> of June and will stay for three months. It consists of six interns from Ethiopia, South Sudan and Sudan. This batch of interns has been divided into two groups to work on developing a toolkit for Eastern Nile Agricultural database and studying application of remote sensing for irrigation management.

#### **Flood Preparedness and Early Warning Young Professionals:**

The Eastern Nile flood Management and Forecasting has created a credible system that links multiple stakeholders to work together to reduce the risk of flood devastation. To support this activity, ENTRO has been recruiting young professionals from Eastern Nile countries every flood season. ENTRO then invited the Flood Management Team (FMT) to conduct the 2017 flood preparedness and early warning activity from the mid of June to end of August of 2017. The following are the main deliverables of the program;

- **Rainfall Forecast for Eastern Nile basin:** Three days ahead rainfall forecast conducted using numerical weather forecast model. Other regional and global models are used to calibrate and verify the forecast. The rainfall forecast is disseminated to key Eastern Nile stakeholders and also used as an input for forecasting the flood extent in the basin.
- **Flood forecast for Lake Tana:** The output from Weather Research Forecast (WRF) model is used as one of input data for flood forecast model which use Hydrologic Modeling System (HEC-HMS). The HEC-HMS model produce runoff which is used as upper boundary condition for the Hydraulic model HEC-RAS to get the extent of flood inundated depth and number of flood affected households in the area. The result like flood depth and inundation maps are part of the dissemination to the flood stakeholders.
- **Flood forecast for Blue and Main Nile in Sudan:** Sudan-FEWS is used to forecast flood for the Blue Nile and Main Nile in Sudan. The Sudan-FEWS use three days forecast precipitation data as gridded format from different sources (RFE, TRMM and CMORPH). The rainfall from three different sources is averaged over the catchment and applied to HEC-HMS model to get hydrological forecast at El Deim station. This flood level will be checked against the safe range for the El Deim station. The result like flood depth and inundation maps are part of the dissemination to the flood stakeholders.
- **Flood forecast for Baro-Akobo-Sobat (BAS) sub basin in Ethiopia and South Sudan:** The forecast system was developed using GIS Flood Tool with Geographic Information Systems (GIS)

to map and compare the characteristics inundation with major historical floods events in the area. The result like flood depth and inundation maps are part of the dissemination to the flood stakeholders.

- **“2017 Flood Preparedness and Early Warning Seasonal Report” was also prepared during the reporting period.**

### **Short-term Outcome 3.2: Stronger EN institutional architecture at regional level to identify, prepare and implement cooperative developments**

**Governance Meetings:** During the reporting period, two governance meetings were held in August 2017 and April 2018.

**EN Governance Meeting, August 2017:** The 31<sup>st</sup> ENSAPT and 30<sup>th</sup> ENCOM governance meetings took place in Merowe, Sudan, 1<sup>st</sup>-3<sup>rd</sup> August 2017. The Meeting made imperative decisions to advance EN cooperation and ENTRO performance. Chief among others, the major decisions are on the following areas:



Timely clearance of arrears and payment of country contributions; to emphasize cooperation within the ENSAP/NBI over bilateral and trilateral issues in trans-boundary water resources; to grant a one-time salary increment to ENTRO local staff and local consultants; to extend terms of ENTRO ED and SRPC until February 2018; to expedite mobilization of resources for the implementation of the short term BAS projects, initiate resource mobilization for ENTRO prepared Watershed Management Projects; and to undertake resource mobilization toward establishing standards and guidelines for spillway design in the Eastern Nile; ENTRO to align its next five year strategic plan (2018-2022) with NBI 10 year Strategy; and ENTRO to devise mechanism for extending enhanced technical support and capacity building to Republic of South Sudan.

#### **EN Governance Meeting, April 2018:**

The 32<sup>nd</sup> ENSAPT and 31<sup>st</sup> ENCOM was held from 1<sup>st</sup>-3<sup>rd</sup> April 2018 Khartoum, Sudan. (32<sup>th</sup> ENSAPT from 1<sup>st</sup> -2<sup>nd</sup> and ENCOM 31<sup>st</sup> on 3<sup>rd</sup> April). The meeting passed significant decisions which have utmost importance to lead the performance of ENTRO forward. The



meeting took considerable time and discussed on various key issues including: Matters arising during the 30<sup>th</sup> ENCOM Meeting (clearing Country Contribution Arrears and preparing Resource Mobilization Strategy); Corporate and ENSAP Activity Report); approval and adoption of ENTRO 2018 - 2022 Strategic Plan; approval of ENTRO annual audited financial statement; and ENTRO Senior Management Positions.

ENTRO team took part in the ENCOM and ENSAPT Governance Meetings, apart from reporting on the midyear ENSAP performance, was also playing key role in presenting and explaining ENTRO 2018-2022 Strategic Plan which was adopted and approved during this Meeting. Further, the team finalized the Minutes of the Meeting and submitted them for signature.

**NBI 10-year Strategy:** ENTRO ED, Senior Regional Project Coordinator and SDCU head provided input and took active participation in the formulation of this ten year strategy in which key basin wide water resources management and development priorities along with institutional ones were identified. Thus 6 goals and 32 strategic directions (objectives) were identified and agreed upon to guide NBI centers for the next ten years, 2017-2027.

**ENTRO Strategic Plan (SP), 2018-2022 – Planning, consultations, Complete Write-up; Presentation to Governance for adoption and approval:** It is to be recalled that ENTRO, among the NBI Centers, has been pioneering strategic planning, the first one extending from 2006 -2010 and the second one, 2014-2019 was midway in the implementation when NBI came out with the ten year strategy on the basis of which the strategic plans of the three centers would be built. Hence, it was found to make a mid-term evaluation of the second ENTRO Strategic Plan and realign with NBI 10 year strategy in terms of time line (ENTRO's 2018-2022) and substantive content (strategic goals, directions). ENTRO formed a Strategic Planning task force which comprises of Senior Regional Project Coordinator, Social Development and Communication Unit Head and Monitoring and Evaluation Officer to take the lead, and have undertaken a ten-day retreat 13<sup>th</sup>-22<sup>nd</sup> December 2017.

The work started on the basis of a Road Map prepared. Milestone activities of the Strategic Plan Preparation included: (a) preparing a time-line and milestones (b) assembling the required source and reference materials (c) examination of and aligning with the basin-wide NBI 10-year (2017-2027) Strategy (d) Mid-term review of ENTRO 2014-2019 Strategic Plan (including examination of Performance Appraisal of the Strategy). Iterative processes of developing content of the Strategic Plan (i.e. definition of mission, vision, values, goals, strategic directions, results, indicators action plan and budget, implementation arrangements: Risks and Mitigation Strategies) had taken several weeks. The Task Force then prepared annotated Table of Contents circulated it for comments and discussion, to guide compilation and write-up. Finally the Task Force undertook the complete write-up of the entire document, print-readying the materials. At the 32<sup>nd</sup> ENSAPT one-day Retreat the Task Force presented the SP content for inputs, comments, etc. Finally, the Strategic Plan was presented to the ENCOM, which approved and adopted the document to guide ENTRO's work for the next four years i.e. 2018-2022.

**Table 2: Planned activities which are not accomplished as per the plan and reasons for the variance:**

<b>S.N.</b>	<b>Activities which haven't accomplished as per the plan</b>	<b>Reasons for the variation</b>
1.	Effect advanced and second payments for the consultant and review of study deliverable for the Ground Water study	Delays in getting no objection from the World Bank of the ToR resulted in delays in consultant contract signature
2.	Consultant contract signature and effect of advance payment for both WSM and Irrigation studies.	Delays in getting no objection from the World bank of the ToR resulted in delays consultant selection
3.	Dam safety awareness workshop for Senior officials and decision makers	Because of the consultants busy schedule and prior commitments.
4.	Procure and supply of foundational resources to national dam safety units ( software, equipment, reference materials, etc)	Based on consultation with countries, the items and budget have been revised.
5.	Conducting a study and workshop on Coordinated Operation of Transboundary Cascade Dams in Eastern Nile: Preparatory Phase	Based on the consultation workshop with key stakeholders, the scope of work had been modified. Hence the Activity had been accomplished partially
6.	Training workshop: Dam safety and Reservoir sedimentation for Eastern Nile water resource experts.	Because of the Resource person's other commitments. (to be hired by WB).The workshop held from 6-8 August, 2018
7.	Training workshop on Cascade dams Operation for Senior officials and decision makers	Because of budget revision (In consultation with WB).
8.	Experience Exchange Visits to Rivers basin with coordinated cascade dam operation	Because of budget revision (In consultation with WB).
9.	Regional Capacity building in SD, SDG, Safeguards	Overextended SDCU Unit Head
10.	Stakeholder awareness, ENTRO, Ethiopia	Difficult to synchronize times with ENSAPT, Ethiopia
11.	Capacity building in Climate Financing	No environment officer to undertake the task and the SDCU Head is too extended to assume
12.	Conducting the Integrated Knowledge Portal (IKP) under "Eastern Nile - Knowledge Enhancement "	<ul style="list-style-type: none"> <li>• The TOR for the project was changed to integrate with all the NBI centers.</li> <li>• The procurement process took long time</li> </ul>

13.	Procurement of IT related goods	Due the current issue related to foreign currency problem in Ethiopia it was hard to get goods with the right specification on the shelf
14.	EN Media training and Water Diplomacy Workshop	Late budget disbursement

### 3.2 Sustainability of Results:

The Dam safety Roadmap developed as part of the phase I dam safety activities and the Road map for coordinated operation of cascade dams in EN outline clear path in moving forward to implement standard dam safety practice and setting up coordinated operation of dams in EN countries. The Road Maps present a recommended plan to implement comprehensive regional program. This is now being implanted at Regional and National level. Implementing this Road map and strengthen the National and Regional dam safety units are a key to sustain the successful achievements so far.

Thanks to the foundation laying work of the past years, Social Development, development communication and environment functions are already mainstreamed into the operations of the ENTRO and are influencing the preparation of investment projects. Further thru the communication and stakeholder functions of the SDCU efforts are being made to navigate the difficult hydro politics and creatively find ways to get around the challenges and still promote EN wide, inclusive participation in ENSAP/ENTRO.

A number of capacity building trainings workshops were facilitated at national level to strengthen the planning and implementation capacity of experts in the EN which has utmost importance to sustain the project gains/achievements. Also, the active involvement of stakeholders during consultation workshops and project study reviews has created common understanding and ownership feeling which will impact positively the sustainability of the deliverables into the next steps. For instance, all BAS stakeholders are actively engaging in the study of the project; with the national project coordinators, regional technical working group and the project steering committee on board.

Resources Mobilization: ENTRO has prepared four investment ready watershed projects (two in Ethiopia and two in Sudan) which have been taken over from the Eastern Nile Watershed Management. Not only implementing these projects is a priority but also scaling them up to cover the most important larger hotspots of degradation. To this end, impact assessment of watershed management projects is underway to identify the best watershed management technologies and practices that have proven effective in restoring degraded watersheds and improving the livelihood of the people and reducing the level of endemic poverty. In parallel, the procurement process has been started to develop most viable scaling up strategy. On the other hand, to implement the short terms projects and prepare the medium and long term projects of BAS, resources mobilization is a top priority. In this regard mobilizing the requisite resources from within and outside the region should be emphasized to sustain the foregoing project achievements.



## 4 Program Management:

ENTRO has exerted considerable effort in coordination and management fostering strong team-work and collaboration within ENSAP projects and other crosscutting functional units. ENTRO management was closely following the implementation process of each ENSAP project. In addition to the implementation of the ongoing ENSAP projects, ENTRO played pivotal role in mobilizing resources thru developing project concept notes and project briefs. Also, ENTRO sustained the internship program working with EN Universities and Ministries. The Program has been successful in bringing together young EN professionals who will be the managers and decision makers of tomorrow, enabling them to share experiences, develop trust and mutuality and learn from the realities that is going on in the EN.

## 5 Program Expenditures:

This budget utilization report is prepared on the basis of the annual work plan & budget for July 2017-June 2018. Out of the total US\$ 2.4 million annual budget revised for July 2017-June 2018, USD 1.8 million (75%) was utilized over the last twelve months ending 30<sup>th</sup> June 2018. The reasons for the variance between the planned and actual expenditure are described in the table below.

**Table 3: Summary of Actual Expenditure against the Planned Budget:**

ENSAP Annual Budget Vs Actual Expenditure, July 2017-June 2018				
ENSAP /ENTRO projects with funding sources	Annual Planned Budget	Annual Actual Expenditure	% utilized	Reasons for the variance, if any
NCORE-CIWA	697,407	558,837	80%	
BAS -AFDB	444,657	487,689	110%	Because of exchange rate difference (Euro to USD)
Country Contribution	725,551	660,400	91%	
GIZ	424,346	93,365	22%	Budget saving while conducted the National Water Diplomacy CB workshops; Modification of scope of work for Dam Safety activity; and late budget disbursement for media training and Water diplomacy workshop
EU/GIZ	100,000	-	0%	Contract Agreement hadn't been signed as a result budget not disbursed
<b>Total</b>	<b>2,391,961</b>	<b>1,800,291</b>	<b>75%</b>	

## 6 Major Challenges & Constraints and Mitigation strategies:

**Shortage of manpower:** This challenge has been indicated earlier and is persistent. It is understandable that under the current operating environment, ENTRO is striving to do more with less, leveraging its limited manpower and expertise to the maximum. Example- In contrast to the original plan which envisaged a pool of three professionals (social development expert, communication expert and environment expert), ENTRO is now making do only with one person, who is striving to combine the various responsibilities pertaining to the three disciplines. The Challenge was overcome by simply working long hours and weekends and some of the activities have been taken forward to the next budget year. In the next budget year some of the activities e.g. Climate Financing will be outsourced. Thanks to CIWA-AF2 and GIZ funding support, with the former SDCU has been enabled to recruit a young professional to intern and choose from, and with the latter to recruit and retain one of them as Junior Communication Officer for the next two years. We hope in the next years, the communication officer challenge will have been alleviated.

**Flood Forecast and Early Warning:** The major challenges ENTRO faced while conducting the flood forecast and early warning activity were: The models we used need to be updated to perform well and using new techniques and models, which needs a capacity building for the team; there is lack of ground thru thing data for the flood prone areas in South Sudan. If this issue is addressed, it will support greatly the output of the forecast and make it better reliable; The workstations are outdated and don't have processing capacity for the models which takes long time to process; and stakeholders' update is not done over the last three years which constrained to disseminate our knowledge products to relevant stakeholders.

**Internet connection:** It is the main challenge especially for the flood forecast and early warning activity. This work requires good connection to timely disseminate the forecast results. ENTRO should explore other options like using cloud service. In addition, The IT infrastructures are outdated and needs replacing with better performance server, workstation, etc. Intermittence of electricity supply (power outage) has been the other challenge.

**Internship program:** ENTRO Internship faced a challenge of getting the right candidate with the relevant experiences who can work as per the the TOR. ENTRO will explore more options such as posting the announcement thru ENTRO website to increase the number of applicants which deserve our expectations. Towards this end, ENTRO will give better chance for interns coming from Ministries and Universities in the EN as far as they fulfill the requirements in the TOR. ENTRO is thus working closely with Ministries and Universities to nominate relevant candidates by the countries.

**Country Contribution:** Increasingly country contribution is becoming a more reliable source of funding for ENSAP. ENCOM 30<sup>th</sup> has resolved to effect timely clearance of arrears and payment of country contributions. Accordingly, South Sudan committed to partially clear its Country Contribution. However, this commitment is not realized yet, and as of 30<sup>th</sup> June 2018, ENTRO still expects a total of 1,284,667 USD from South Sudan. ENTRO is working with the RSS to resolve the issue.

## 7. Lessons Learned and Recommendations

The main lesson learned is that team-work is the key to get over resource challenges and to optimize performance of ENTRO as a whole. The Project Implementation Team (PIT) which is established by ENTRO Management is a good example for ENTRO Team work Efforts. Different units of ENTRO provide overarching functions and are collaborative. ENTRO staff contributed in this direction by supporting management in the execution of its secretariat service functions (e.g. facilitating governance meetings) and leading stakeholder participation and provision of platforms (e.g. Regional Nile Day Celebrations; Nile Development Forum) in addition to the preparation of strategic documents (e.g., 5-year strategic plan; communication strategy; etc.) and representing ENTRO, as needed, in 3-center coordination and planning meetings (e.g. formulation of basin wide 10 year NBI Strategy, State of the Basin, etc.). Thus, it is commendable to continue the team work culture at ENTRO complementing with incentive mechanisms to the staff, which is a crucial working strategy especially when there is manpower shortage. To this end, continuing the resource mobilization effort with diversified funding partners is also imperative to resolve the manpower shortage.

Participation and sharing of ENTRO's experience to wider participants at national and international conference, like SANCOLD, is imperative to enhance the visibility of ENTRO. It has also an opportunity to interact with professionals working in the sector and share different experiences that can be implemented / adopted in the Eastern Nile taking into account our specific context. So, ENTRO needs to diversify its partnership and collaboration at different level.

In order to implement an effective flood forecast and early warning activity, the Eastern Nile countries need to collaborate with ENTRO in providing real time data and also to disseminate our forecast results timely to the right stakeholders. In particular, the forecast unit at the Ministry needs to work closely with ENTRO.

Going forward the SDCU function will evolve into an overall safeguards unit, influencing investment project identification and preparation holistically i.e. inputting robust social development and environment dimensions into the process and facilitating stakeholder participation and networking thru enhanced development communication work. Toward this end there will be the need to include, as early as resources permit, an environment officer, at least at a junior level.