CRITICAL ECOSYSTEM PARTNERSHIP FUND

CEPF Final Project Completion Report

Organization Legal Name:	Addis Ababa University
Project Title:	Conserving Fish in Lake Tana and Abay Basin, Ethiopia
Grant Number:	63341
CEPF Region:	Eastern Afromontane
Strategic Direction:	1 Mainstream biodiversity into wider development policies, plans and projects to deliver the co-benefits of biodiversity conservation, improved local livelihoods and economic development in priority corridors.
Grant Amount:	$197,435.00
Project Dates:	January 01, 2014 - June 30, 2018
Date of Report:	September 22, 2018

Implementation Partners

List each partner and explain how they were involved in the project

Mr. Shewit Kidane (From Bahir Dar University)
He worked on the status of the diversity, distribution and relative abundance of the *Labeobarbus* spp. of Lake Tana. He also worked on the age of the spp. and assessment of the stock related to their migratory behavior and management measures.
Mr. Alayu Yalew (From Bahir Dar Fisheries and Aquaculture Research Center)
Mr. Alayu conducted different experiments on catfish, as a mechanism of developing alternative fisheries, which included hatchery experiments in which he developed protocol for catfish hatchery. He also conducted experiments on the growth of catfish in three different production system intensities: Extensive, Semi-intensive and Intensive production systems.
Mr. Belay Abdissa (From Bahir Dar Fisheries and Aquaculture Research Center)
Mr. Belay worked on the simulation experiment (breeding of *Labeobarbus* spp. in man made pond and canal emulating the natural environment).
Dr. Eshete Dejen (From Intergovernmental Authority for Development (IGAD)).
Dr. Eshete was involved in policy mainstreaming and organizing the different awareness creation workshops and events.

Conservation Impacts

Summarize the overall impact of your project, describing how your project has contributed to the implementation of the CEPF ecosystem profile

Determining the status of the *Labeobarbus* spp. of Lake Tana
Surveys were made at selected stations all around Lake Tana using experimental fishery and catches from fishermen (several manuscripts were prepared for publication on the findings-two published and attached).
Cat fish experiments:
Hatchery: The hatchery experiment set-up has been established and we have managed to get fingerlings reared under hatchery conditions, which later on were transferred to the different intensities of the fish farming systems: A protocol has been written and produced on how to go on through the hatchery process, taking our specific conditions into consideration.
Extensive production experiment: Fingerlings of catfish reared in hatchery were introduced into naturally flooded ponds in the Fogera Plains, Eastern Lake Tana. There was no intervention in terms of supplying additional feed, etc..in these ponds. The growth of the catfishes was monitored through time.
Semi-intensive production experiment: Fingerlings of catfish reared in hatchery were introduced into farmers' ponds at Chara, small district south of Bahir Dar, and at a research station of the Bahir Dar Fisheries Research center.. The farmers have benefitted and they continued production of catfish after the trial experiments (see attached file on catfish).
Intensive producion experiments: An intensive recirculating system was established consisiting of a series of fish tanks at the Bahir Dar Fisheries and Aquaculture Research Center. Fingerlings reared at the hatchery were introduced into the tanks, fed with supplementary feeds and the pH and temperature were all controlled. The growth performance of the catfishes was monitored under different stocking density scenarios and different feeding regimes (manuscript was prepared for publication on the results of the three systems).
Simulation experiment in man-made ponds:
The simulation experiment was designed to emulate the natural way of breeding of the *Labeobarbus* spp. in the feeder rivers. Accordingly, a pond emulating the lake and waterway canals emulating the feeder rivers were constructed. Male and female mature *Labeobarbus* spp. were introduced into the ponds. The fishes later were found performing similar acts as they perform naturally and were able to swim "upstream" into the canals and successfully spawn within the gravels. The experiment was done for one common species (*Labeobarbus brevicephalus*) and we are trying to repeat the experiment for the different *Labeobarbus* species specially for the rare and threatened species. In 2014 53,000 fingerlings of Labeobarbus; in 2017, 35,000 and in 2018 45,000 were released into Lake Tana.
Awareness creationraising events:
World Fish Migration Day event (2014): During this event, besides distribution of about 2000 leaflets, a Police Marsh Band has accompanied the mass marchers to go through the streets of Bahir Dar to demonstarte to the public the importance of the *Labeobarbus* spp. and the threeats looming over them. Moreover, a workshop was organized for representatives of different stakeholders to popularize the impacts of overfishing, degradation, and other factors on the breeding behaviour and survival of the fish species.
World Fish Migration event (2016): The World Fish Migration Day in 2016 was celebrated in Bahir Dar with two main events. Running competition was conducted on the main streets of Bahir Dar and reed boat paddling competition took place at the shore areas of Lake Tana. These two events had attracted the attention of thousands of people from the city and the surrounding areas.

World Fish Migration event (2018): This was the time in which the invasive water weed water hyacinth (*Eichhornia crassipes*) has become a serious problem in Lake Tana. It is currently more critical to the migration of *Labeobarbus* spp. in feeder rivers because it is completely blocking their migratory routes to upstream parts of the streams and rivers. Therefore, we have managed to organize a trip to the river mouth (where the river joins the lake) of one of the feeder rivers on the northeastern part of the lake. Hundreds of teachers and students, policy makers, researchers and farmers have joined the gathering where we were able to see how the water hyacinth blocks the migratory route of the *Labeobarbus* spp. We all have shown our solidarity by actively participating in the physical removal of the weed from the lake shore and the river mouth.
Moreover:
Thousandsof leaflets were distributed and banners were also posted on main streets of Bahir Dar during the different events.
The team has also particpated in several radio and TV interviews to speak about the importance of the *Labeobrabus* spp. and the threats posed on them that were disseminated throughout the region and beyond.
There have been repeated discussions with policy makers on how to develop Fisheries management plan for the Lake Tana fishes, which later on took effect.
Portraits of the endangered and vulenerable *Labeobrabus* spp. were published on an official stamp of the Government of Ethiopia in March 2017.
Lastly, we have made assessment study on the effects of our awareness creation/ raising efforts and we were able to receive very encouraging feed backs (compiled in a manuscript to be published----"Asessing the status of awareness creation on Lake Tana fisheries and its environs: Knowledge, Attitude and Practices (KAP)" (see attached MS Word file with complete details).

Planned Long-term Impacts - 3+ years (as stated in the approved proposal)

Impact Description	Impact Summary
Improvement of the Labeobarbus spp. stock in Lake Tana Implementation of fishery options in the area.	The project has worked on fishery options in the area so as to reduce the pressure that could otherwise be exerted on the Labeobarbus spp. by the capture fisheries. One feasible option is to harvest fish from culture fisheries (aquaculture). Cat fish (Clarias gariepinus) is a very good candidate for aquaculture by farmers in the Lake Tana region. Moreover, the Fogera plains that remain flooded for a considerable length of time during and after the rain season (July to November) are appropriate sites to introduce larger sized fingerlings and harvest them before the dry season. This has been tested and proven possible for scaling up. The farmers who introduced catfish in their farm yard ponds have also found this fish to be good for production, sale and consumption. Moreover, using man-made breeding programs, we were able to stock 53000 fingerlings of Labeobarbus spp. in 2014; 35,000

	in 2017 and 45,000 in 2018.
Readiness on the part of fishermen, local farmers and development workers (who are extension agents that assist local farmers and fishermen in the implementation of Government policies) to implement fishery management measures	It appears that most fishermen and extension workers are aware of the problems and are ready to implement the fishery management plan, although much remains to be done in order to monitor, control and prevent illegal fishermen and illegal fishing gears from operating in the lake. There needs to be multiple stake holders including government and non-government bodies acting on these issues. We have shared our knowledge on the issue to relevant stakeholders and actors and we believe that they will take it up and bring it to the next higher level (proper implementation of the proclamation and subsequent management plan). The respondents' knowledge with regard to the fish resource base decline is very high. About 95 % of respondents are aware that fish resource has decreased, 85% mentioned the fish weight decreased and 88% complained CPUE/day dramatically declined.Most of the respondents (78%) have the experience that the size of their catch is getting smaller from year to year due to overexploitation. About 75% of the respondents are aware on the fish breeding season and time and the role of wetlands. The knowledge on the emergence of new threat (Water Hyacinth) is about 73%. More than 65% knows about the devastating effect of the monofilament imported from Sudan.
Implementation of proper management plans that include closed seasons, gear regulation, licensing of fishermen, and restocking.	There is the Fisheries proclamation for the country and also for the Amhara Regional State (both attached) that provide general and legal provisions. The management plan is detailed action plan to regulate the fishing activities (closed season, monitoring of illegal fishermen, licensing fishermen, monitoring of fishing gears, etc), in which its implementation has become challenging. The limitations for proper implementation is due to shortage of skilled manpower and financial resources. There are ten woredas (lowest administrative unit in Ethiopia) surrounding Lake Tana and the fishermen are found distributed in these woredas; the landing sites are also far apart from each other. It is not easy to monitor and implement the management plan.

Planned Short-term Impacts - 1 to 3 years (as stated in the approved proposal)

Impact Description	**Impact Summary**
Increased awareness and understanding of the threats on Labeobarbus spp. and the aquatic habitats in the Lake Tana and	The project has worked extensively in this direction and we believe that positive impacts have been achieved. After repeated campaigns through several events that

Abay Basins.	include workshops, seminars, marches, running competition, boat paddling competition, banners, and portraying them on official government stamps, fishermen, extension workers and policy makers are all very much aware of the importance and the threats faced by the Labeobarbus spp. The exercise on Knowledge Attitude and Practices Survey was carried out on five surrounding Woredas of Lake Tana (Bahir Dar, Dembia, GunderZuira, Libo and South Achefer) from March 2017-April 2017. The survey targeted three groups (fishers/farmers, policy/ development officers and students/teachers). A total of 226 individuals were interviewed from the three groups. The respondents' knowledge with regard to the fish resource base decline is very high. About 95 % of respondents are aware that fish resource has decreased, 85% mentioned the fish weight decreased and 88% complained CPUE/day dramatically declined.Most of the respondents (78%) have the experience that the size of their catch is getting smaller from year to year due to overexploitation.
Proper implementation of the Fishery Proclamation.	The issues in the fishery proclamation were setting specific management plan for the specific lake (Lake Tana). Now the management plan is in place, although implementation of the same still remains a challenge.
Development of fishery options in the area Formulation of proper management plans that include closed seasons, gear regulation, licensing of fishermen, and restocking.	The project has contributed its share in urging the Amhara Regional State to develop management plan for the fisheries of Lake Tana. Accordingly, a management plan has been developed by the Bureau of Agriculture of Amhara Region, which includes closed season, gear regulation, licensing of fishermen and restocking. The Bureau with its meager manpower and resources is struggling to implement the plan on Lake Tana. However, there is no specific species action plan developed.
Increased income through production of catfish in some selected households Identification, prioritization and conservation of highly threatened Labeobarbus spp.	Through the surveys we made at all corners and sides of Lake Tana, we have identified the status of the fifteen species of Labeobarbus including their distribution and relative abundance at selected sites. We have identified the rare species and prioritize them so that they could receive closer attention for conservation. African catfish, C. gariepinus fingerlings have been reared in a hatchery at Bahir Dar and distributed to model fish farmers and stocked in Lake Tana. A total of 12 farmers were engaged in catfish farming using fish culture ponds (9 farmers) and impounding waters (3 farmers). Since 2016 a total of 14, 649 African catfish fingerlings with a size of 30g and more were distributed to these

	farmers. Most of the harvested fish from ponds were used for home consumption. But 3 farmers are growing catfish for market and got an average net income of 3, 439 Ethiopian birr in a pond of 100m2 in one production cycle. Currently, these 3 farmers restocked their ponds with 3000 fingerlings (1000 each) and growing fish for market. More than 45, 000 C. gariepinus fries reared in the hatchery were stocked to Lake Tana since 2016.

Describe the success or challenges of the project toward achieving its short-term and long-term impact objectives

Successes:

- **We managed to successfully survey the lake from all its sides and assess the current status (diversity, distribution, relative abundance and age structure) of the *Labeobarbus* spp. We are now at a position to provide advise to policy makers on what should be done to conserve the vanishing spp.**
- **It was possible to rear fingerlings of catfish in a hatchery and test their growth in different fish farm systems (extensive, semi-intensive and intensive fish farm systems). The results in the performance of the catfish in the different systems are prepared in manuscripts to be published in due time.**
- **The simulation experiment was a great succeess in terms of conserving the *Labeobarbus* spp. under the worst case scenario, in which the normal migration of the species is hampered by the prevailing different negative impacts (overfishing, habitat degaradtion, the blockage of migration by the newly emerging water hyacinth, etc.) and the fishes are not able to migrate upstream for breeding and the lake fails to be naturally restocked by these spp. We were able to "cheat" the fishes to migrate "upstream" in man made canal and breed in grevel filled part of the canal. We have taken the fertilized eggs and followed their development in the laboratory.**
- **More importantly, the awareness creation/raising activities will have long lasting impacts on the conservation of the *Labeobarbus* spp, We have organized successive and successul events related to the World Fish Migration Day events, which were celebrated worldwide in 2014, 2016 and 2018. In addition:**
    - **Portatrits of the enadngered and vulnerable *Labeobarvbus* spp. were published on the Government's official stamp**
    - **Thousands of leaflets were distributed**
    - **Workshops and seminars were organized**
    - **A book on the diversity and utilization of the freshwater fishes of Ethiopia that includes the *Labeobrabus* spp. of Lake Tana was published**

Challenges:

- **The political instability in the country, especially in the Amhara Region where LakeTana is located, has, to some extent, affected our activities including sampling efforts in the field.**
- **The frequent power shortage in the country had some negative impacts on our experiments in the laboratory; we had to install back-up power and with considerable diesel expenses.**
- **Organizing events and raising awareness among political leaders have also been challenging in a situation where the turnover of authority was very high.**

- **Getting appropriate and quality equipment and supplies in good time has remained a challenge through out the project time.**

Were there any unexpected impacts (positive or negative)?

Positive:
It is during the life time of this project that Lake Tana was recognized as a Biosphere Reserve by UNESCO. We believe that the works done on the scientific and economic importance and the threats facing the *Labeobarbus* spp. have contributed to the recognition of Lake Tana by UNESCO as a Biosphere Reserve. It will have positive impact on the conservation of the *Labebarbus* spp. and acceptance by policy makers of the various measures suggested by our findings.
Negative:
The emergence of the invasive water hyacinth (*Eicornhea crassipes*) in the eastern and northeeastern parts of Lake Tana has been unexpected additional negative impact, which may worsen the conservation problem of the *Labeobarbus* spp.when compounded with other previously existing threats.

Project Components and Products/Deliverables

Describe the results from each product/deliverable:

Component		Deliverable		
#	Description	#	Description	Results for Deliverable
1	Enhanced population of Labeobarbus species through conservation hatchery and development of other fishery options	1.1	A package of methods and protocols becomes available on the captive breeding of Labeobarbus spp. for potential restocking and conservation of the gene pool;	Simulation experiments were conducted and successful results were obtained. It was possible to enable the fishes swim "upstream" in man made canals to be able to breed (spawn) within the gravel in the pools in the upper part of the canal. The methods, the procedures and the actions were all well documented in written form, in pictures and video films. This procedure needs to be repeated for all the Labeobarbus spp., especially for those rare and endangered species. Concurrent spawning of multiple spp. needs also to be tested in the future.
1	Enhanced population of Labeobarbus species through conservation hatchery and development of other fishery options	1.2	A package of methods and protocols becomes available on the hatchery and growth of catfish, as alternative fish production scheme in the Lake Tana sub-basin;	A protocol and procedure on catfish hatchery and grow out has been prepared; shared in previous progress report.
1	Enhanced population of Labeobarbus species through conservation hatchery and development of other fishery options	1.3	Two presentations on research findings	Seven oral presentations (attached) were made from the findings of the project at international and national fora including the annual conferences of the Ethiopian Fisheries and Aquatic Sciences Association (EFASA), the Biological Society of Ethiopia (BSE) and the Pan African Fish and Fisheries Association (PAFFA) conference. The presentations were made by the Principal Investigator (Abebe Getahun) and the three partners (Alayu Yalew, Belay Abdissa and Shewit G/Medhin). Moreover, a poster (attached) was presented at the Addis Ababa University Research day, where findings from all major research projects were exposed to the public.

1	Enhanced population of Labeobarbus species through conservation hatchery and development of other fishery options	1.4	Two research publications	Fourteen manuscripts were prepared by the investigators of which two were published and others are either under review, just submitted or under preparation for submission. The titles of these manuscripts are provided under the "Summary questions". Moreover, a book on "Freshwater fishes of Ethiopia: Diversity and utilization" was also published.
1	Enhanced population of Labeobarbus species through conservation hatchery and development of other fishery options	1.5	A report on the positive and negaive impacts of the catfish hatchery and restocking processes.	The catfish fingerlings reared in a hatchery were introduced into man-made ponds in the farmers' yards and also into some isolated natural ponds in the Fogera plains, but not restocked into Lake Tana. So, we didn't find it important to study the impacts of the hatchery and restocking of the catfishes.
1	Enhanced population of Labeobarbus species through conservation hatchery and development of other fishery options	1.6	A report on the contribution of the fishery of Labeobabus species over the years and its contribution to the fishey sector, food security and employment	We have prepared and published a review manuscript on the subject matter titled "A Drivers-Pressure-State-Impact-Responses Framework to Support the Sustainability of Fish and Fisheries in Lake Tana, Ethiopia".
1	Enhanced population of Labeobarbus species through conservation hatchery and development of other fishery options	1.7	Pilot ponds and hatchery procedures	The hatchery procedures and protocols are well documented. The fingerlings of catfishes were introduced into the pilot ponds constructed at the research station and at the framers' yards.
2	Improved understanding by all stakeholders of Lake Tana and	2.1	1,000 copies of books on the fish fauna of Lake Tana	1000 copies of the book on "Freshwater fishes of Ethiopia: Diversity and utilization" have been published and distributed. The book contains a chapter on the Abay basin (Tana sub-basin) and all the fishes inside the basin that include Labeobarbus spp.

	Abay Basin on the conservation status and problems of fish and fisheries in the region.			
2	Improved understanding by all stakeholders of Lake Tana and Abay Basin on the conservation status and problems of fish and fisheries in the region.	2.2	Better understanding of pressure on fishery leading to species action plan	The current situation and the future trends in the fish and fishery status of Lake Tana have been studied and documented. The fishes and fishery of Lake Tana are faced with and suffering from unprecedented threat from over exploitation, habitat degradation, pollution, illegal fishing, and more recently from the emergence of an invasive water weed (Eichhornia crassipes----Water hyacinth). However, there is no species specific action plans, despite the fact that the fisheries management plan mentions about the conservation of the Labeobarbus spp.
3	Increased awarenss and preparedness among fishermen, development workers and administrators to tackle the problems of conservation in the Lake Tana sub basin	3.1	About 100 direct stakeholders will have increased awareness of the severity of the problem, through two workshops; .	The two workshops were conducted and about 200 participants attended these workshops. It is thought that they have increased awareness on the status, importance and the dangers facing the Labeobarbus spp. of Lake Tana. Most of these participants were targets of our questionnaire survey on "Assessing the Status of Awareness Creation on Lake Tana fisheries and its environs: Knowledge, Attitude and Practices (KAP)". The results of the survey indicate that the particpants have benefited from various awareness creation events including the workshops.
3	Increased awarenss and preparedness among fishermen, development workers and administrators to tackle the problems of conservation in the Lake Tana sub basin	3.2	Some 2000 leaflets will be distributed to the key stakeholders and the general public;	More than 2000 leaflets have been distributed during the awareness creation/ raising events that took place together with the World Fish Migration events.
3	Increased awarenss and	3.3	Four TV and eight radio	Through the different awareness creation/raising efforts (more than 6--the World Fish Migration events,

	preparedness among fishermen, development workers and administrators to tackle the problems of conservation in the Lake Tana sub basin		programs will be conducted; Some 10000 people around Lake Tana will develop awareness (through mass media) about the importance of the Labeobarbus spp. and the dangers looming over them;	conferences, workshops), the mass media was always there to broadcast the event through radio, TV and print media (mainly the media in the Amhara Regional State). We believe that these broadcasts have reached the wider public (more than 10,000) through out the region and beyond. We have prepared a questionnaire to determine how far these efforts have been successful and received feed back from localities on the border of Lake Tana (Direct zone). A manuscript was prepared on "Assessing the Status of Awareness Creation on Lake Tana fisheries and its environs: Knowledge, Attitude and Practices (KAP)". The results clearly indicated that the majority of those interviewed are well aware of the importance of and the threat over the Labeobarbus spp. of Lake Tana.
3	Increased awarenss and preparedness among fishermen, development workers and administrators to tackle the problems of conservation in the Lake Tana sub basin	3.4	Mainstream the conservation of fishes into policy planning	We have managed to raise awareness of the policy makers and the issue of fish conservation in Lake Tana has become the agenda of the regional government, which ultimately contributes to making Lake Tana recognized by UNESCO as a "Biosphere Reserve". Moreover, the Regional Government, noting the importance of fish conservation in Lake Tana, developed management plan for the fishes and fisheries of the lake.
3	Increased awarenss and preparedness among fishermen, development workers and administrators to tackle the problems of conservation in the Lake Tana sub basin	3.5	Policy briefs based on findings of component 2 and using the policy briefs advocacy for better management of the species	We have made available findings of the diversity, distribution and relative abundance in catch composition of the Labeobarbus spp. of Lake Tana to all stakeholders in a workshop organized for this purpose in Bahir Dar in June 2017 (Presentation of the PI attached) . The workshop was attended by representatives of the stakeholder institutions in the region (Bahir Dar University, Amhara Region Agricultural Research Institute, Bureaus of Agriculture, Environment, Water resources, Administration, Fishermen cooperatives, Schools, etc.). Unfortunately, there was no policy brief after the workshop.
3	Increased awarenss and	3.6	Pictures of species on	The portraits of the fishes were displayed on stamps, officially released by the Postal Services Agency, Ethiopia.

	preparedness among fishermen, development workers and administrators to tackle the problems of conservation in the Lake Tana sub basin		postage stamps	

Please describe and submit any tools, products, or methodologies that resulted from this project or contributed to the results.

The following are products from the peoject:

- **Protocol on cat fish hatchery and grow out in Ethiopia**
- **Portraits of the *Laboebarbus* spp. on official stamps**
- **Seven oral presentations at conferences and workshops**
- **Poster presentation at Addis Ababa University research day event**
- **A book on "Freshwater fishes of Ethiopia: Diversity and utilization"**
- **Leaflets and banners distributed and displayed**
- **The following papers are ready for publication (some published or submitted or under review and CEPF is acknowledged in all):**
    - **A Drivers-Pressure-State-Impact-Responses Framework to Support the Sustainability of Fish and Fisheries in Lake Tana, Ethiopia (Published in "Sustainability" journal)**
    - **Effect of large weirs on abundance and diversity of migratory *Labeobarbus* species in tributaries of Lake Tana, Ethiopia. *Published in African Journal of Aquatic Science*.**
    - **Study on the reproductive and growth performance of the African catfish, *Clarias gariepinus* (Burchell, 1822) in captivity for enhancing aquaculture.**
    - **Effect of broodstock size on spawning, fertilization, hatchability and fry survival in the African catfish, *Clarias gariepinus* (Burchell, 1822).**
    - **Local zooplanktons and effect of feeding frequency on the growth and survival of the early larvae of African catfish, *C. gariepinus* (Burchell, 1822).**
    - **Growth performance of indigenous African catfish,*C. gariepinus* in three production systems.**
    - **Comparisons in productivity and economic benefit between three culture systems of African catfish, *Clarias gariepinus*.**
    - **Comparison of age determination methods for the endemic *Labeobarbus* species in Lake Tana, Ethiopia.**
    - **The endemic species flock of *Labeobarbus* spp. in L. Tana (Ethiopia) threatened by extinction: implications for conservation management.**
    - **Simulation as a conservation strategy for saving the endemic *Labeobarbus* spp. flock (Pisces: Cyprinidae) of Lake Tana, Ethiopia**
    - **Assessing the status of awareness creation on Lake Tana fisheries and its environs: Knowledge, Attitude and Practices (KAP)**

- **Validation of the periodicity of growth zone deposition in the asteriscus otoliths of the four endemic *Labeobarbus* species in Lake Tana (Ethiopia): by edge type and marginal increment analysis.**
- **Age and growth determination of the three *Labeobarbus* species in Lake Tana, Ethiopia**
- **Assessment of the sustainable yield and optimum fishing effort for the stock of *Labeobarbus* species in Lake Tana, Ethiopia.**

Lessons Learned

Describe any lessons learned during the design and implementation of the project, as well as any related to organizational development and capacity building.

Consider lessons that would inform:

- Project Design Process *(aspects of the project design that contributed to its success/shortcomings)*
- Project Implementation *(aspects of the project execution that contributed to its success/shortcomings)*
- Describe any other lessons learned relevant to the conservation community

Our collaboration with the Amhara Regional Agricultural Research Institute (Bahir Dar Fisheries Research Center) and Bahir Dar University has faciliatated our work immensely. The involvement of graduate students in the project was a great contribution to the successful completion of the project as well as to the preparation of several scientifc manuscripts on the results of our experiments and surveys.

Sustainability / Replication

Summarize the success or challenges in ensuring the project will be sustained or replicated, including any unplanned activities that are likely to result in increased sustainability or replicability.

The simulation study conducted is exempleray and could be replicated in situations similar to ours. We conducted the experiment to ensure the migration of the spp. for breeding to upstream portions of the rivers. This was made possible by emulating the natural environment and the natural behaviour of breeding of the fishes. We have constructed a concrete pond resembling the lake's environment. The pond is connected with a canal that emulates the feeder rivers. Mature spawner fishes were grown in separate ponds and were also brought from the wild. The fishes were introduced into the pond and were followed up for their movements. The male and female fishes after making trial trips up stream through the canal finally reached the upper part and were able to spawn there. The fertilized eggs were collected and their embryonic development was followed in the laboratory. The Bahir Dar Fisheries and Other Aquatic Life Reseaerch Center will continue on the experiments and

productions of fingerlings of Labeobarbus spp to restock the lake. This has been incorporated in the regular duites of the center and we know that the activities continue during the months of July and August, 2018--the migratory period of the Labeobarbus spp., and which is after the completion of this project. Moreover, the Bureau of Agriculture and Natural Resources of the Amhara Regional State has shown initiatives to construct catfish hatchery infrastructures and also replicate the construction of simulation ponds to intensify the production of catfish and Labeobarbus spp.
Another remarkable achievment of the project is the documentation of the findings of the project. We have managed to prepare fourteen manuscripts (some of which are published) and one book. Copies of the book are submitted and the published manuscripts are attached to this report. Future publications will be sent to CEPF.

Safeguards

If not listed as a separate Project Component and described above, summarize the implementation of any required action related to social, environmental, or pest management safeguards

The project is largely experimental compounded with awareness creation/raising activities and it has followed the standard scientific procedures in collecting data in the laboratory and in the field. We believe that there is no adverse impact resulting from our experiments on the environment and the people living around the project area.

Additional Comments/Recommendations

Use this space to provide any further comments or recommendations in relation to your project or CEPF

CEPF has been very much supportive in conserving the Labeobarbus spp. of Lake Tana. This has been one of the few freshwater based projects in the region. It is well known that freshwaters are inverted islands and the habit is too fragile to be ignored. We believe that the works so far done have been very helpful in the conservation of the fish species and their habitats. However, the conservation efforts and developing alternative livelihoods for those that exert pressure on the natural system need to be continued and intensified. We believe that the Government institutions and Non-Government organizations will take up the good practices and build up on the past achievements.

Additional Funding

Provide details of any additional funding that supported this project and any funding secured for the project, organization, or the region, as a result of CEPF investment

Total additional funding (US$)
$169,250.00

Type of funding

Please provide a breakdown of additional funding (counterpart funding and in-kind) by source, categorizing each contribution into one of the following categories:

A Project Co-Financing (other donors or your organization contribute to the direct costs of this project)

B Grantee and Partner Leveraging (other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF funded project)

*C Regional/Portfolio Leveraging (other donors make large investments in a region because of CEPF investm*ent or successes related to this project)

A. In-kind support

- **Addis Ababa University in-kind support in providing transport assistance, office space, basic salary and also assisting in the organization of the different World Fish Migration events**
- **Bahir Dar Fisheries and Aquaculture Research Center in-kind support in providing experimental ponds, aquaria, transport assistance, office space, basic salary for partners and also assisting in the organization of the different World Fish Migration events**
- **Bahir Dar University in-kind support in providing transport assistance, office space, basic salary for a partner and also assisting in the organization of the different World Fish Migration events.**

Estimates of the in-kind support:

Addis Ababa University

Item	**US$**
Office space	**15,000**
Lower rate vehicle	**5,000**
Basi c salary for PI	**45,000**
Total	**65,000**

Bahir Dar Fisheries and other aquatic life research center

Ponds	**5000**
Office space	**10,000**
Laboratory space	**15000**
Basic salary for partners (2)	**50,000**
Total	**80,000**

Bahir Dar University

Banners	**4000**
Vehicle (Low rate rental)	**5000**
Meeting space	**3000**
Total	**12,000**
Overall total:	**157,000**

B. Continuation fund for some of the experiments from Mohammed Bin Zayed Species Conservation Fund in cash (US$12,500)

Information Sharing and CEPF Policy

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned, and results. Final project completion reports are made available on our Web site, www.cepf.net, and publicized in our newsletter and other communications.

1. Please include your full contact details (Name, Organization, Mailing address, Telephone number, E-mail address) below

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