



Darwin Initiative Annual Report



Department
for Environment
Food & Rural Affairs

Important note: To be completed with reference to the Reporting Guidance Notes for Project Leaders:
it is expected that this report will be about 10 pages in length, excluding annexes

Submission Deadline: 30 April

Darwin Project Information

Project Reference	20-015
Project Title	Economic incentives to conserve Hilsa fish (<i>Tenualosa ilisha</i>) in Bangladesh
Host Country/ies	Bangladesh
Contract Holder Institution	International Institute for Environment and Development
Partner institutions	Bangladesh Centre for Advanced Studies (BCAS) and Bangladesh Agricultural University (BAU)
Darwin Grant Value	£208,316 (Year 1 grant £59,507)
Start/end dates of project	Start date: 04/2013 End date: 03/2016
Reporting period	Apr 2013 – Mar 2014; Annual Report 1
Project Leader name	Essam Yassin Mohammed
Project website	http://www.iied.org/bangladesh-protecting-hilsa-overfishing
Report author(s) and date	Essam Yassin Mohammed; 16 May 2014 (date agreed)

1. Project Rationale

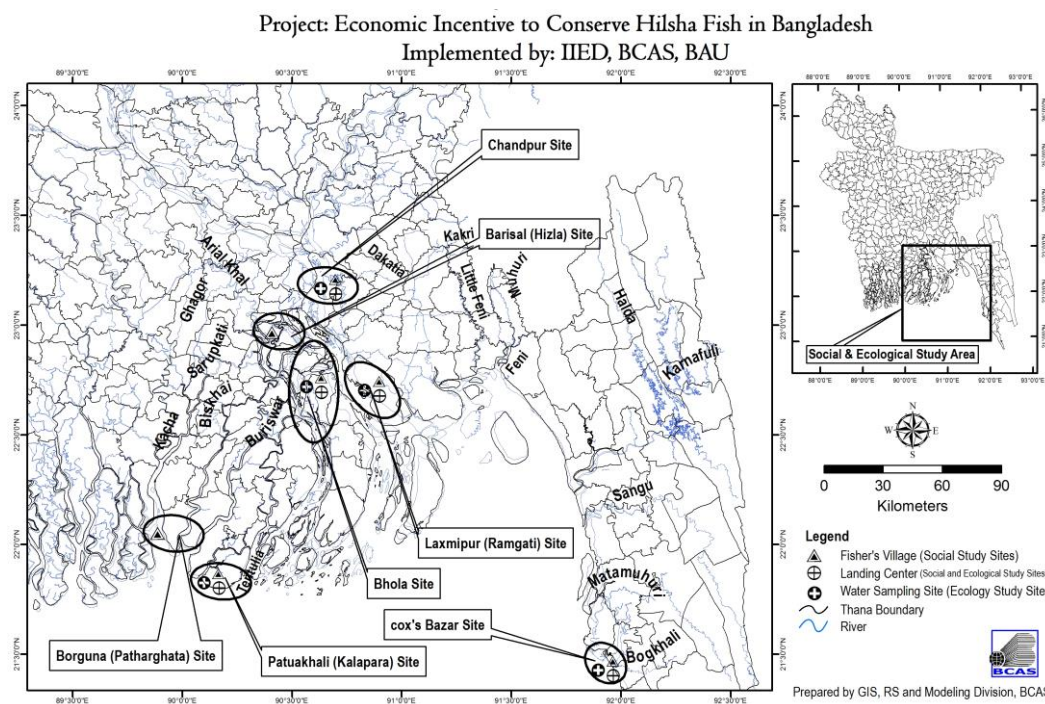
The Hilsha (*Tenualosa ilisha*) fishery is by far the largest single species fishery in Bangladesh; providing full time employment for about 450,000 'professional' fishermen and 2.5 million part time fisher folk. Hilsha is the most affordable and preferred fish among the poor; thus contributing to poverty alleviation. But it is feared that the fish stock could collapse in the near future as the fishery is overly exploited. The exploitation rate of Hilsha increased sharply from 0.33 (under exploited) in 1990 to 0.66 (over-exploited) in 2002 (latest available data).

This prompted the government to declare four sites in the coastal areas of the country as Hilsha sanctuaries (see figure 1) preventing fishing during the reproductive season. To compensate for lost earnings, the government has started providing "affected" fisher communities (186,000 households) with 30 Kg of rice per household and alternative income generating activities.

However, a preliminary study carried out in March 2012 by the proposal partners identified a number of weaknesses such as mistargeting that reduce the effectiveness of the payment scheme in conserving fish stocks and compensating the poorest fishers. These reflect gaps in knowledge on both the functioning of complex marine ecosystems, and socio-economic characteristics of the fisher communities. This project aims to fill this gap by redesigning the system that rewards people who help to protect it. Working in partnership with Bangladesh Centre for Advanced Studies and Bangladesh Agricultural University and in collaboration with the Department of Fisheries of the Government of Bangladesh, we are working with affected

communities and ecosystems to learn about what is working and what is not, and to find ways to improve it.

Figure 1: Studysite map



2. Project Partnerships

This research project was developed and is being carried out in partnership with the Bangladesh Centre for Advanced Studies (BCAS), Bangladesh Agricultural University (BAU) and the Department of Fisheries (DoF) of the Ministry of Fisheries and Livestock of Bangladesh. Host country teams played a major role in defining the research question and identifying critical knowledge gaps with respect to hilsa fishery in the country.

The partnership was developed through the process of organising multi-stakeholder workshop on ‘incentive-based approach to protect hilsa fishery’ that was held in Dhaka prior to the Darwin funded project. The partnership (including government buy in) was further strengthened through the Darwin Initiative funded project. The nature of partnership that was developed between IIED, BCAS, BAU and the Government of Bangladesh was hailed as ‘exemplary’. IIED’s core group has produced a Reflect & Act paper that showcases the level of partnership developed. [<http://pubs.iied.org/pdfs/17199IIED.pdf>]. The Reflect & Act paper states that “...the political will generated by this project is expected to carry over into a new project funded by the Darwin Initiative. IIED and partners will help develop an effective, equitable and sustainable PES project that will reduce threats to marine biodiversity and support livelihoods of hilsa fishers in Bangladesh, Myanmar and India.”

Another indicator of government buy in and support, is the fact that the inception workshop of this project was hosted by the Department of Fisheries, and senior officials including the Secretary of Ministry of Fisheries and Livestock (MoFL) and the Director General of the Department of Fisheries (DoF) attended the full-day workshop.

3. Project Progress

Most of Year 1 activities are on track and in some cases exceeded the targets. However, inevitably there have been some delays particularly in completing the field survey in time mainly due to the political unrest during the election period of Q4 of last year. Details of progress of Year 1 activities are provided in the subsequent sections.

3.1 Progress in carrying out project activities

Improved understanding of current ecological and socio-economic characteristics of hilsa fishery

Inception workshop: The inception workshop was held on 25 May 2013 at the conference room of the Department of Fisheries (DoF) in Matshya Bhaban, Dhaka, Bangladesh. The workshop was attended by 34 participants including representatives from the DoF, District Fisheries Officers (DFO), hilsa fishermen, National Fishermen Association, local and international NGOs, and Fisheries Scientists from Bangladesh Fisheries Research Institute (BFRI) and other academic institutions. Mr Uzzal Bikash Dutta, Secretary of the Ministry of Fisheries and Livestock, and Mr Syed Arif Azad, Director General of the DoF were among the senior government officials who attended the inception workshop.

The workshop included technical sessions which outlined the methodological building blocks of the project and identified knowledge gaps with respect to hilsa fishery management and development.

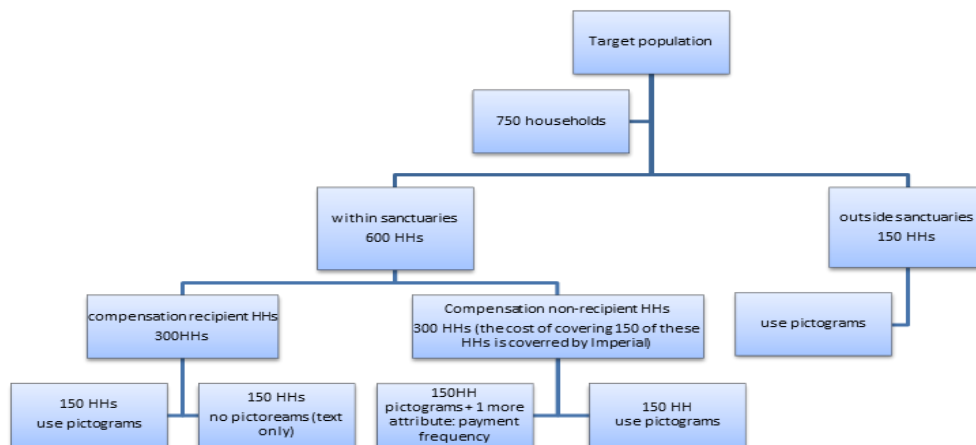
Data collection: Data collection process for both socio-economic and ecological studies of the project has already commenced. 36 focus group discussions (FGD) with about 570 subjects of different groups: fishers, middlemen, retailers, money lenders, labourers and women members of fisher households were held in Chandpur, Laxmipur, Bhola, and Patuakhali Districts. 12 Key Informant Interviews (KII) were also held. The findings from FGDs and KIIs are being analysed and will be used to design a questionnaire survey which will aim to assess the preferences of fishers for compensation packages, and estimating the opportunity cost (or lost revenue) due to the ban period and zone.

Based on information gathered using FGDs and KII, a questionnaire survey was designed. The questionnaire includes questions on socioeconomic characteristics of fisher households, attitudinal and behavioural questions, fishing activities, coping strategy, opportunity cost (loss in earning), and assessment of preferences. A pilot survey with 28 households was conducted. The questionnaire was then revised and finalised. A total of about 750 households will be surveyed. While a significant majority of our subjects (600) will be from within the sanctuary area, 150 households from outside the sanctuary area will also be surveyed. This is done to assess the differences in socioeconomic factors of the fisher households between the sanctuaries and outside the sanctuaries.

To assess the preferences of the subjects, the team has decided to employ a **choice experiment** technique. This is done to assess the preferences of the participant households for compensation type and level. 120 permutations of choice options with 6 attributes were designed. These choice options were paired to presented in aggregates of 6 choice cards of 10 bundles. The research team also decided to present the choice experiment questions in two different formats namely: pictograms and text only. This is done to examine the potential impacts of pictograms on stated preferences of the respondents. In addition, a time frame is included as one of the attributes to examine the implicit discount rate of respondents.

Even though, the survey is slightly delayed due to political unrest between November 2013 – March 2014, particularly in and around the study sites, we to complete it by mid-June. The host-country team (BCAS) has recruited two more enumerators to speed up the completion of the survey.

Figure 2 Sampling protocol



The ecological and biological component of the project led by BAU has also started collecting data on physical, chemical and hydrological parameters of the study sites. Four sampling stations have been selected for the study. The stations are the confluence of Padma and Meghna river at Chandpur, lower part of Meghna river in Doulatkhan, Bhola, Tentulia river in Lalmohon, Bhola, and Andarmanik river, Kalapara, Patuakhali. Sampling of all physical, chemical, and biological parameters, and hilsa specimens are being collected monthly from Chandpur station. Physical, chemical and biological parameters of the water body are measured bi-monthly from other three stations. Physical parameters include air and water temperature, turbidity, water colour, total dissolve solids (TDS), total suspended solids (TSS), and conductivity.

Hydrological parameters such as water current velocity and depth are also being monitored. To examine primary productivity the following parameters are being measured: dissolve oxygen (DO), PH, total alkalinity, salinity, nitrate-nitrogen (NO₃-N), nitrite-nitrogen (NO₂-N), ammonia-nitrogen (NH₃-N), phosphate-phosphorus (PO₄-P) and chlorophyll-a. Both phytoplankton and zooplankton in river water are also being identified qualitatively and quantitatively to genus level. Gut content analysis is also being done to assess food and feeding biology of hilsa. Food preference index is analyzed using the 'Electivity Index'. All the analyses were done following standard methods. Standard, fork and total lengths, and body weight were measured. Gonad was collected after eviscerating the fish, and the fish were sexed as either male or female observing the gonad with naked eye. This will enable us to estimate the gonadosomatic index (GSI) of each fish specimen [GSI = (GW/BW) * 100] to determine the reproductive cycle and seasonality of hilsa. The biological and ecological survey is on track and is an on-going activity.

Improved understanding of institutional capacity needs, opportunities and gaps to ensure the effective management and functioning of the scheme

We aim to assess existing legal and policy framework analysis (2.1) and technical and institutional capacity needs assessment (2.2). BCAS has commissioned the work to Dr Monirul Islam from Dhaka University to conduct the study. While there was good progress at initial stages of the study, the work has been slightly delayed due to the political unrest. The work is now back on track and the first draft of the report will be ready by end of May 2014. This will then be revised and finalised before the end of Q1 of this financial year.

Project outputs are disseminated to influence decision making in Bangladesh and beyond

While the majority of the activities for this output were scheduled for years 2 and 3, significant progress has been achieved in Year 1.

- A project page has been created on the IIED’s website which includes a Darwin Initiative logo.
- A press release was issued and circulated to journalists
- A blogpost on IIED’s website

- A project flyer has been produced and distributed in Bangladesh and the UK. The project flyer is available on request.

Publication:

- Direct economic incentives for sustainable fisheries management: the case of hilsa conservation in Bangladesh [completed and available online]
- A review of conservation trust funds for marine and coastal conservation [in press]

3.2 Progress towards project outputs

As discussed above [cross referenced], project activities are mostly on track. However, due to some delays mainly caused by political unrest (key assumption made in the project proposal) production of some knowledge products has been delayed. This includes; report on physical and hydrological parameters of hilsa fishery (expected to be completed by end of Q2 Year 2), opportunity cost of participating in the payment scheme (expected to be completed by Q1 Year 2), administrative and transaction cost of the scheme (expected Q1 Year 2) and technical and legal framework assessment report (expected Q1 Year 2).

Possible recurrence of similar risk (political instability) was discussed in the end of year 1 project meeting in Dhaka. The project team believes that this is less likely going to happen until next year (local elections). Therefore we have decided to plan year 2 activities accordingly.

The project continues to gain support from the Department of Fisheries of Bangladesh and therefore we believe that the project is very likely to achieve output level objectives by its close.

Key achievements of year 1 activities include:

Communication and dissemination

The project has received good media coverage including:

- 06 May 2013 [Financial Express, Bangladesh] “UK dives in to save the hilsa” <http://www.thefinancialexpress-bd.com/index.php?ref=MjBfMDVfMDZfMTNfMV85MF8xNjg1NTU=>
- 06 May 2013 [Times of India, India] “UK dives in to save the hilsa” http://articles.timesofindia.indiatimes.com/2013-05-05/special-report/39041876_1_hilsa-bangladesh-fishing-restrictions
- 06 May 2013 [GreenEnvirons, Bangladesh] “Hilsa dishes are at stake...!” <http://greenenvirons.blogspot.co.uk/2013/05/ome-of-mostdelicious-bengali-dishes-are.html>
- 30 May 2013 [Daily Star, Bangladesh] “Project launched to make efforts more effective” <http://www.thedailystar.net/beta2/news/project-launched-to-make-efforts-more-effective/>
- 04 Jun 2013 [U-landsnyt, Denmark] “Projekt i Bangladesh belønner folk for at skåne truede fisk” <http://www.u-landsnyt.dk/nyhed/04-06-13/projekt-i-bangladesh-bel-nner-folk-sk-ne-truede-fi>
- 07 Jun 2013 [Dhaka Courier, Bangladesh] “The many sides of our Hilsa Compensation Scheme” <http://www.dhakacourier.com.bd/?p=12010>

Publication: A report titled ‘*direct economic incentives for sustainable fisheries management: the case of hilsa conservation in Bangladesh*’ was produced. The release of the paper was followed by extensive media coverage in Bangladesh including:

Dhaka Tribune

Five ways to boost stocks of hilsa fish

<http://www.dhakatribune.com/bangladesh/2013/nov/28/five-ways-boost-stocks-hilsa-fish>

Daily Star

Bangladesh’s compensation scheme can be model for other countries

<http://www.thedailystar.net/beta2/news/bangladeshs-compensation-scheme-can-be-model-for-other-countries/>

Independent

Regional cooperation can boost hilsa reserve: IIED

http://www.theindependentbd.com/index.php?option=com_content&view=article&id=194754:regional-cooperation-can-boost-hilsa-reserve-iiied&catid=110:business-others&Itemid=156

Dhaka Courier

Five ways to boost stocks of the Bay of Bengal's beloved Hilsa fish

<http://www.dhakacourier.com.bd/?p=14748>

New Age

Regional cooperation can boost hilsa reserve in Bay: study

<http://www.newagebd.com/detail.php?date=2013-11-28&nid=74668#.Upqxye7TsQ>

United News of Bangladesh

Regional cooperation can boost hilsa reserve in Bay: Study

<http://unbconnect.com/hilsa-report/#&panel1-2>

Conferences:

Even though there were no plans to present project outputs in international conferences in Year 1, we have already participated in 3 international conferences namely:

- International Conference on Policy Mixes in Environmental and Conservation Policies 25 - 27 February 2014 in Leipziger KUBUS, Leipzig, Germany
- envecon 2014: Applied Environmental Economics Conference 14th March, The Royal Society, London
- IIED conference on Innovations for equity in smallholder PES: bridging research and practice 21 March in Edinburgh, UK

3.3 Progress towards the project Purpose/Outcome

The contribution of this project locally dubbed as “the Darwin project” in bringing the attention of many stakeholders on the compensation scheme and hilsa management has been significant. Many media outlets have covered about hilsa fishery over the last one year. This has helped hilsa fishery management to receive sufficient attention from policymakers and other stakeholders. Even though it is difficult to attribute to the Darwin project, it was recently reported that there was a record high hilsa catch level in the Southwest rivers of Bangladesh. While the DoF attributes this to the compensation scheme, the impact of the scheme has to be rigorously assessed and verified. Nonetheless, we can confidently say that an effective compensation scheme has the potential reverse the current negative trend on hilsa fishery. The research team has also been engaging policymakers at different tiers of the administrative hierarchy and enhancing their understanding about the socioeconomic and ecological characteristics of hilsa fishery. The potential impact of the compensation scheme on poverty alleviation and its distributional implications is yet to be assessed.

3.4 Goal/ Impact: achievement of positive impact on biodiversity and poverty alleviation

The project's goal is that 'hilsa fish stock is maintained, and threats to marine biodiversity are avoided in line with CBD targets (Aichi Biodiversity Target 6) and the CMS. Food security is improved because of improvement in fish stocks and livelihood diversification for poor fisher communities'. Even though it is very early to examine the contribution of the project to this goal at this stage, we believe that an effective economic incentive mechanism (compensation scheme) can potentially reduce threats to biodiversity. Some of the compensation/payment provided by DoF includes food grain and alternative income generating activities. The improved payment mechanism for hilsa conservation will contribute to poverty alleviation through (1) improved targeting of those affected by fishing restrictions to ensure that the poorest fishers are not made poorer, (2) tailoring the payment/compensation to fit their most preferred compensation packages, and (3) enabling continued employment in hilsa fishery – which supports up to 450,000 fishermen. Through this project, we are also aiming to minimise some

negative spill overs such as local market distortion as a result of the compensation scheme. Our project activities are still geared towards achieving this goal.

4. Project support to the Conventions (CBD, CMS and/or CITES)

Initial engagements with Mr Mesbahul Alam, Secretary of the Ministry of Environment and Forest of Bangladesh and national CBD focal point were held. The research team decided to focus on research design and data collection in Year 1 of the project period. Increased engagements with key stakeholders including the CBD and CMS focal points will be done in Year 2 and Year 3 of the project period. This was discussed in the project meeting we held in Dhaka in April 2014.

5. Project support to poverty alleviation

The project will contribute to poverty alleviation among fisher communities through:

Inclusivity of the compensation scheme: one of the weaknesses of the existing payment mechanism that this project is trying to tackle includes problems associated with inclusion and exclusion error. We aim to mitigate (not eliminate) this by working closely with the Department of Fisheries to effectively identify eligible (or affected) hilsa fishers. Even though this will be mainly informed by the study on *equitable benefit sharing mechanism* (Year 2 activity) we have already started addressing this issue. In the multistakeholder workshop we held, we brought together representatives of fisher communities and government officials together to discuss some critical issues that determine the effectiveness of the scheme. Problems of inequities in the compensation scheme were raised by the representatives of the fisher communities and they strongly suggested that the government issues identification cards to the eligible fishers. In response to this, according to the Director General of the DoF Mr Syed Arif Azad, the government has decided to speed up the process of issuing ID card to fishers. This can be claimed as one of the noticeable achievements of this year. An example of the ID card is shown below. Effective identification of the most affected hilsa fishers will ensure that less harm is done as a result of the government imposed restrictions on fishing period and zone.

Figure 3 Hilsa fishers ID



Minimise unwanted consequences: the project also aims to assess the potential impacts of the fishing restrictions and compensation scheme beyond the hilsa fishers. We will be examining the impacts of the scheme on local market distortion. This includes, (1) potential impacts of food grain distribution on local food market (price elasticity of supply of rice and other consumable commodities); (2) impacts on the local labour market; and (3) impacts on local financial market (e.g. loan repayment, interest rates, etc.). By informing the DoF on how to minimise unwanted or unintended consequences of the scheme, the project will aim to ensure

delivery of maximum societal wellbeing or in other words minimising harm. This will have a positive impact on poverty alleviation.

Continued employment: As mentioned in the problem statement section of the report more than 2.5 million fishers are directly or indirectly employed in hilsa fishery. If current threats to hilsa fishery are not mitigated, millions of jobs could be lost. Therefore, through effective and sustainable management of hilsa fishery, in the long term, the project will contribute towards saving millions of jobs and livelihoods.

6. Monitoring, evaluation and lessons

The project team (BCAS, BAU, DoF, and IIED) has held 3 project meetings – in May and August 2013, and April 2014. In each meeting, the team went through the logical framework of the project and monitored progress and limitations. During the first meeting the team revisited the project plan and drew concrete, detailed and coherent workplan for Year 1 of the project period. Second project meeting was held in August. The August meeting mainly focused on methodology of data collection process for both socioeconomic and ecological components of the project. During the meeting, data collection methods, survey design and protocol were agreed. Five study sites namely: Chandpur, Laxkimpur, Bhola, Patuakhali, and Cox's Bazaar were identified. The team visited Chandpur District which is one of the important study sites. In the April 2014 meeting, the project team decided to set up an *advisory team* which monitors and evaluates project activities and outputs. The advisory team will be comprised of Dr Atiqur Rahman (Executive Director, BCAS), Dr Salimul Huq (Senior Fellow, IIED), and Mr Syed Arif Azad (Director General, DoF). This will enable the project team to mitigate potential risk and deliver project outputs in a timely manner. This will also ensure government buy in and ownership, which is a critical element for the sustainability, exist strategy and legacy of the Darwin Initiative funded project.

7. Actions taken in response to previous reviews (if applicable)

N/A

8. Other comments on progress not covered elsewhere

[see section 3.1 and 3.2]

9. Sustainability

The team has had structured engagements with key policy makers including: Director General of the Department of Fisheries, Secretary of the Ministry of Fisheries and Livestock, and Mr Zahid Habib Manager of the Government Sponsored *Jatka* Conservation Project. The central objective of the structured engagement is to ensure the uptake of the research results by the key governmental institutions in Bangladesh and have a longer term impact.

10. Darwin Identity

In addition to extensive media coverage which explicitly mentioned the support from the Darwin Initiative (See sections 3.1 and 3.2), the DI logo has been used in the following significant occasions.

Darwin Hilsa project information was mentioned in the daily local newspaper "**Chandpur Barta**" (Chandpur News) on 26 August 2013.

The Article "Hilsa Resource Management: Jatka Conservation and Future Potential" by Syed Arif Azad, Director General, Department of Fisheries, published in the newspaper supplement of the daily **Samakal** dated 18 March 2014 on the occasion of Jatka Conservation Week. Please see figure below. The newspaper supplement included messages from the Prime Minister of Bangladesh, the Secretary for Ministry of Fisheries and Livestock, and other senior government officials – all highlighting the importance of hilsa fishery.

Darwin Logo has been used in the Banner and Folder of the Inception Workshop of the project "Economic Incentive Hilsa to Conserve Hilsa fish in Bangladesh" held on 25 March 2013, and in the newspaper supplement of the daily "Samakal" published on 18 March 2014 on the occasion

of Jatka Conservation Week 2014 by DoF. We have also used the Darwin Initiative logo the project webpage on IIED's website. We have also used the DI logo in project flyer, publication, and conference presentations. It is not an exaggeration to mention that in Bangladesh the Darwin Initiative is increasingly being associated with hilsa fishery management.

Figure 4 Newspaper supplement (Samakal)



11. Project Expenditure

Table 1 project expenditure during the reporting period (1 April 2013 – 31 March 2014)

Project spend since last annual report	2013/14 Grant (£)	2013/14 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				

Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL	59,507	59,593	0%	

Variance on travel and subsistence 11%; this is mainly due to underspend by IIED of £717, and overspend by BCAS of £100

12. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

I agree for the Darwin Secretariat to publish the content of this section (please leave this line in to indicate your agreement to use any material you provide here)

In this section you have the chance to let us know about outstanding achievements of your project over the year that you consider worth highlighting to the Darwin Secretariat. This could relate to achievements already mentioned in this report, on which you would like to expand further, or achievements that were in addition to the ones planned and deserve particular attention e.g. in terms of best practice. We may use material from this section for various promotion and dissemination purposes, including for example, publication in the Defra Annual Report, Darwin promotion material, or on the Darwin website. As we will not always be able to ask projects on an individual basis for their consent to publish the content of this section, please note the above agreement clause.

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2013-2014

Project summary	Measurable Indicators	Progress and Achievements April 2013 - March 2014	Actions required/planned for next period
<p>Goal/Impact</p> <p>In the longer term, Hilsha fish stock is maintained, and threats to marine biodiversity are avoided in line with CBD targets (Aichi Biodiversity Targets 6) and the Convention on Migratory Species (CMS). Food security is improved because of improvement in fish stocks and livelihood diversification for poor fisher communities.</p>		<p>Perhaps it is too early to assess the long term impact of the project activities, but the assumption that an effective payment scheme would deliver positive biodiversity outcomes and thereby contribute to food security and poverty alleviation. The project team will have structured engagement with CDD and CMS focal points.</p>	
<p>Purpose/Outcome</p> <p>By the end of the project, an improved mechanism for ensuring sustainable management of Hilsha fishery is put in place, incorporating incentives conditional on compliance with fishing restrictions and other provisions of management plans. These plans are based on ecological and socioeconomic assessment and agreed in a bottom-up participatory process with fisher communities. An effective payment mechanism reduces threats to marine biodiversity and contributes to poverty alleviation through improved targeting of those affected, maintaining a food source for the poor, and enabling continued employment of small-scale fishers in Bangladesh and beyond; Myanmar</p>	<p>Indicator 1 Increased number of “impacted” households and individuals involved in the payment scheme</p> <p>Indicator 2 Equitable benefit distribution system reflects the preference of the fisher communities</p> <p>Indicator 3 A sustainable national Hilsha fish conservation fund to finance the scheme fits existing institutional and technical capacity</p> <p>Indicator 4 Exploitation rate (ER) of Hilsha fishery in the lower Meghna reduced to optimal level (0.5)</p> <p>Indicator 5 The project outputs influence decision making process in Bangladesh and beyond.</p>	<p>Through the socioeconomic survey that we are conducting, and equitable benefit sharing study (Year 2 activity) – we aim to mitigate/minimise exclusion and inclusion errors.</p> <p>Socioeconomic survey which includes assessment of preferences using the choice experiment technique is being conducted</p> <p>Year 2 Activity. In Year 1 we reviewed experiences at international level which will inform the hilsha conservation fund study. Report in press.</p> <p>A record high catch level (not catch per unit effort) has been reported in Southwest Waters of Bangladesh. This is very promising but needs verification</p> <p>We have constantly been engaging the government of Bangladesh. As stated in the narrative report, government buy in and support has been extremely encouraging</p>	<p>Research outputs will be effectively communicated to influence decision making process</p> <p>Equitable benefit distribution system (EBDS) document will be prepared. The document will be agreed/indorsed by the government and fisher community representatives</p> <p>A study on the principles of hilsha conservation fund will be completed and endorsed by the government</p> <p>Evidence on catch level improvement and other indicators (e.g. CPUE) will be collected</p> <p>We will continue to engage key actors of change and start liaising with regional stakeholders from India and Myanmar in preparation for the regional workshop</p>

and India.			
Output 1. Improved understanding of current ecological and socio economic characteristics of hilsha fishery	<p>Indicator 1 Ecological baseline assessment</p> <p>Indicator 2 Clear understanding of the costs of refraining from fishing during off season</p> <p>Indicator 3 Clear understanding of the preference of the fisher communities for payment type and level</p> <p>Indicator 4 Cost benefit analysis of conserving hilsha fish stocks</p>	<p>This is an ongoing activity. Study sites have been selected and data is being collected on a regular basis. In Year 2 we will produce a preliminary report</p> <p>Socioeconomic survey includes questions on “opportunity cost”. Once completed we will produce a report</p> <p>Assessment of preference using the choice experiment method is being conducted.</p> <p>A report on the administrative and transaction cost of the scheme will be produced in Q1 Year 2.</p>	
Activity 1.1 Inception workshop		Completed	
Activity 1.2 Physical and hydrological assessment of Hilsha fishery		Data collection ongoing. Preliminary report in Y2	
Activity 1.3 Chemical and biological assessment of Hilsha fishery		Data collection ongoing. Preliminary report in Y2	
Activity 1.4 Assessment of spawning and reproductive seasonality of Hilsha		Data collection ongoing. Report on spawning seasonality of hilsha in the lower Meghna to be produced in Year 2.	
Activity 1.5 Assessment of the opportunity cost of participating in the payment scheme		Data collection on going.	
Activity 1.6 Estimation of the transaction and administrative cost the scheme		Data collection on going.	
Activity 1.7 Assessment of the preference of the public for payment formats (level and type)		Data collection on going.	
Output 2. Improved understanding of institutional capacity needs, opportunities and gaps to ensure the effective management and functioning of the repayment	<p>Indicator 1 Existing legal and policy frameworks assessed</p> <p>Indicator 2 Technical and institutional capacity needs identified</p> <p>Indicator 3 Capacity-strengthening</p>	<p>Interviews with key stakeholders and a review of existing legal frameworks completed. Report to be produced in Q1 Y2 (indicators 1 and 2)</p> <p>In year 2 (as a result of the above mentioned study) a capacity strengthening action plan document (policy briefing paper) will be produced.</p>	

scheme	action plan and strategy	
Activity 2.1 Existing legal and policy framework analysis		Study completed. Report to be produced in Q1 Y2.
Activity 2.2 Technical and institutional capacity needs assessment		Study completed. Report to be produced in Q1 Y2. (Activities 2.1 and 2.2 have been merged)
Activity 2.3 Capacity-strengthening action plan		On going (to be completed in Q 2 Y2)
Output 5. Project outputs are disseminated to influence decision making in Bangladesh and beyond	Indicator 1 Number of workshops, research outputs, news articles and press releases Indicator 2 Regional workshop involving policy makers from Myanmar and India	1 inception workshop, 1 publication (available online), 1 press release, 1 blog, and several media mentions [Year 3 activity] – structured engagements with regional stakeholders will resume in Year 2
Activity 5.2 Presentation of research products in major international conferences		Research output presented in 3 international conferences (please see narrative report)
Activity 5.4 Press releases		1 press release produced

Annex 2 Project's full current logframe

Annex 2 Project's full current logframe

Impact

(49 words)

In the longer term, Hilsha fish stock is maintained, and threats to marine biodiversity are avoided in line with CBD targets (Aichi Biodiversity Targets 6) and the Convention on Migratory Species (CMS). Food security is improved because of improvement in fish stocks and livelihood diversification for poor fisher communities

Outcome

By the end of the project, an improved mechanism for ensuring sustainable management of Hilsha fishery is put in place, incorporating incentives conditional on compliance with fishing restrictions and other provisions of management plans. These plans are based on ecological and socioeconomic assessment and agreed in a bottom-up participatory process with fisher communities. An effective payment mechanism reduces threats to marine biodiversity and contributes to poverty alleviation through improved targeting of those affected, maintaining a food source for the poor, and enabling continued employment of small-scale fishers in Bangladesh and beyond; Myanmar and India.

Measuring outcomes - indicators

Indicator 1	Increased number of "impacted" households and individuals involved in the payment scheme
Indicator 2	Equitable benefit distribution system reflects the preference of the fisher communities
Indicator 3	A sustainable national Hilsha fish conservation fund to finance the scheme fits existing institutional and technical capacity
Indicator 4	Exploitation rate (ER) of Hilsha fishery in the lower Meghna reduced to optimal level (0.5)
Indicator 5	The project outputs influence decision making process in Bangladesh and beyond.

Verifying outcomes

Indicator 1	<ul style="list-style-type: none"> ▪ Baseline and end of project assessment of socioeconomics of Hilsha fishery
Indicator 2	<ul style="list-style-type: none"> ▪ Benefit distribution system report ▪ Benefit distribution system agreed by DoF and fisher communities
Indicator 3	<ul style="list-style-type: none"> ▪ National Hilsha fish conservation trust fund – proposal document
Indicator 4	<ul style="list-style-type: none"> ▪ Ecological baseline and end of project assessment report
Indicator 5	<ul style="list-style-type: none"> ▪ Revision of the payment scheme based on the results of the research

	project <ul style="list-style-type: none"> ▪ Discussion on setting up similar schemes in Myanmar and India
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Outcome risks and important assumptions

Assumption 1	Overfishing is the main cause of depletion of Hilsha fish stock
Assumption 2	The DoF continues to support the scheme during the project period and is not subject to political (in)stability

Outputs

Output 1	Improved understanding of current ecological and socio economic characteristics of hilsha fishery
Output 2	Improved understanding of institutional capacity needs, opportunities and gaps to ensure the effective management and functioning of the repayment scheme
Output 3	Enhanced engagement between the Department of Fisheries and fisher communities in the lower Meghna
Output 4	Sustainable national Hilsha conservation fund proposed and agreed by DoF
Output 5	Project outputs are disseminated to influence decision making in Bangladesh and beyond

Measuring outputs

Output 1	
Indicator 1	Ecological baseline assessment
Indicator 2	Clear understanding of the costs of refraining from fishing during off season
Indicator 3	Clear understanding of the preference of the fisher communities for payment type and level
Indicator 4	Cost benefit analysis of conserving hilsha fish stocks

Output 2	
Indicator 1	Existing legal and policy frameworks assessed
Indicator 2	Technical and institutional capacity needs identified
Indicator 3	Capacity-strengthening action plan and strategy

Output 3	
Indicator 1	Based on output 1 and 2 above, 'equitable' benefit distribution system is formulated
Indicator 2	Terms of benefit distribution system are agreed by both the implementing

	governmental agency (DoF) and the impacted communities
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Output 4	
Indicator 1	The principles of setting up Hilsha conservation fund in Bangladesh are defined
Indicator 2	Hilsha conservation fund proposal
Indicator 3	Consultation workshop with DoF, Ministry of Finance, Civil Society and the Private Sector is held
Indicator 4	The proposal is amended and agreed

Output 5	
Indicator 1	Number of workshops, research outputs, news articles and press releases
Indicator 2	Regional workshop involving policy makers from Myanmar and India

Verifying outputs

Indicator 1.1	<ul style="list-style-type: none"> ▪ Report on physical hydrological parameters of Hilsha fishery by quarter 4 of Year 1 ▪ Report on chemical and biological parameters of Hilsha fishery including length-weight relationship by first quarter of Year 2 ▪ Spawning and reproduction seasonality of Hilsha fish by first quarter of Year 2
Indicator 1.2	<ul style="list-style-type: none"> ▪ report on the opportunity cost of participating in the payment scheme by quarter 4 of Year 1 ▪ report on the cost of running the scheme (administrative/transaction costs) by quarter 4 of year 1
Indicator 1.3	<ul style="list-style-type: none"> ▪ A report on the preference of the public for payment types and levels by quarter 1 of year 2
Indicator 1.4	<ul style="list-style-type: none"> ▪ A paper on cost and benefit of the payment scheme and long term economic feasibility by quarter 2 of year 2
Indicator 2.1	<ul style="list-style-type: none"> ▪ A report on legal and policy frameworks assessment relevant to Hilsha fishery and the implementation of the payment mechanism by quarter 4 of year 1
Indicator 2.2	<ul style="list-style-type: none"> ▪ Technical and institutional capacity needs assessment report by quarter 4 of year 1
Indicator 2.3	<ul style="list-style-type: none"> ▪ Capacity-strengthening action plan drafted by quarter 1 of Year 2
Indicator 2.4	<ul style="list-style-type: none"> ▪ Capacity strengthening strategy developed by quarter 2 of Year 2
Indicator 3.1	<ul style="list-style-type: none"> ▪ Equitable benefit distribution system document and community stakeholder consultation report by quarter 3 of year 2 ▪ Community and stakeholder consultation report
Indicator 3.2	<ul style="list-style-type: none"> ▪ Memorandum of understanding is signed between DoF and fisher communities by quarter 4 of year 2
Indicator 4.1	<ul style="list-style-type: none"> ▪ A preliminary report on the principles of Hilsha conservation fund by quarter 2 of year 2
Indicator 4.2	<ul style="list-style-type: none"> ▪ Hilsha conservation fund proposal produced in the second quarter of

	year 2
Indicator 4.3	<ul style="list-style-type: none"> ▪ Consultation workshop held in 3rd quarter of year 2
Indicator 4.4	<ul style="list-style-type: none"> ▪ Hilsha conservation fund is agreed and ratified in the 2nd quarter of year 3
Indicator 5.1	<ul style="list-style-type: none"> ▪ 3 national workshops held (one workshop in years 1, 2 and 3) ▪ 2 Presentation in international conferences (in year 2 and 3) ▪ 5 research paper published in academic journals (in year 2 and 3) ▪ 3 press releases (during inception workshop, national/regional workshop, and ratification of the Hilsha conservation fund) ▪ 12 articles in prominent national and regional newspapers (during the project period)
Indicator 5.2	<ul style="list-style-type: none"> ▪ Workshop report ▪ Participation of delegates from Myanmar and India.

Output risks and important assumptions

Assumption 1	There is a reasonable level of trust between the fisher communities and the government
Assumption 2	The Government of Bangladesh ratifies agrees with the terms of and ratifies Hilsha Conservation Fund.

Activities

Output 1	
Activity 1.1	Inception workshop
Activity 1.2	Physical and hydrological assessment of Hilsha fishery
Activity 1.3	Chemical and biological assessment of Hilsha fishery
Activity 1.4	Assessment of spawning and reproductive seasonality of Hilsha
Activity 1.5	Assessment of the opportunity cost of participating in the payment scheme
Activity 1.6	Estimation of the transaction and administrative cost the scheme
Activity 1.7	Assessment of the preference of the public for payment formats (level and type)

Output 2	
Activity 2.1	Existing legal and policy framework analysis
Activity 2.2	Technical and institutional capacity needs assessment
Activity 2.3	Capacity-strengthening action plan
Activity 2.4	Developing capacity strengthening strategy

Output 3	
Activity 3.1	Design of equitable benefit distribution system
Activity 3.2	Workshop on benefit distribution system
Activity 3.3	Signing Memorandum of Understanding (MoU) between DoF and the fisher

	communities
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Output 4	
Activity 4.1	Study on the principles of Hilsha Conservation Fund
Activity 4.2	First draft of Hilsha Conservation Fund document
Activity 4.3	Consultation workshop to refine the Hilsha Conservation Fund document
Activity 4.4	Ratification of Hilsha Conservation Fund

Output 5	
Activity 5.1	National/regional workshop
Activity 5.2	Presentation of research products in major international conferences
Activity 5.3	Submission of research products to academic journals
Activity 5.4	Press releases

Annex 3 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Number planned for reporting period	Total planned during the project
Established codes								
1A	A PhD candidate from the DoF has been enrolled at the BAU. This is done to build technical capacity of the department			1				1
6A	2 researchers from BCAS have been given training on choice experiment	2					2	2
8	Number of weeks to be spent by UK project staff on project work in the host country	3	3	3			3	9
11A	Number of papers to be published in peer reviewed journals	1	5				1	9
11B	Number of papers to be submitted to peer reviewed journals			3				
12A	Number of computer based databases to be established	1					1	1
14B	Number of conferences/seminars/workshops attended at which findings from Darwin project work will be presented/ disseminated.	3	2	2			3	7
15A	Number of national press releases in host country(ies)	1		1			1	2
15C	Number of national press releases in UK	1	1	1			1	3
16A	Number of newsletters to be produced		1	1				2

17A	Number of dissemination networks to be established	1					1	1
17B	Number of dissemination networks to be enhanced/ extended	1					1	1
18A	Number of national TV programmes/features in host country(ies)			1				1
23	IIED, BCAS, and BAU co-funding							

Table 2 Publications

Type (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
SSM publication series	Direct Economic Incentives for Sustainable Fisheries Management: the case of hilsa fishery conservation in Bangladesh Essam Yassin Mohammed and Md. Abdul Wahab Nov 2013	IIED, London	http://pubs.iied.org/pdfs/16527IIED.pdf	Free download [100 hard copies of the report distributed in Bangladesh]

Annex 4 Onwards – supplementary material (optional but encouraged as evidence of project achievement)

[Publication]

Direct Economic Incentives for Sustainable Fisheries Management: the case of hilsa fishery conservation in Bangladesh

Abstract

Fisheries provide millions of people with a source of livelihood. Yet across the world, these resources are fast diminishing because of pollution, habitat destruction, overfishing, natural disasters and climate change. Traditional approaches to halt this decline focus on regulating against destructive practices, but to little effect. A more successful strategy could be to establish a direct economic incentive mechanism such as payments for ecosystem services (PES), or to incorporate an element of PES in existing regulatory mechanisms.

There are five ways direct economic incentive mechanisms can be used to complement regulatory approaches. These are:

1. compensating for lost earnings from the imposition of marine protected areas (MPAs)
2. compensating for lost earnings from the imposition of closed (no-take) season
3. incentivising coastal habitat restoration activities
4. rewarding the conservation of threatened marine and coastal species
5. rewarding sustainable fishing practices.

Examples from terrestrial environments, and a few from aquatic environments, suggest that economic incentive-based mechanisms can work to protect both livelihoods and environments. But to succeed, these schemes must be underpinned by robust research, clear property rights, effective monitoring and compliance, equitable benefit sharing, and sustainable finance.

One of the rare examples of using a direct economic incentive mechanism for sustainable fisheries management is the payment for Hilsa conservation in Bangladesh. Hilsa is anadromous in nature (an uncommon phenomenon in tropical waters), living in the sea for most of its life, but migrating up to 1200 kilometres inland along major rivers in the Indian sub-continent for spawning. It is also one of the most important single-species fisheries in the Bay of Bengal, which Bangladesh shares with Myanmar and India. 250 million Bengali people are dependent on Hilsa for nutrition and more than half a million people for their livelihoods. Hilsa also has significant cultural value.

Hilsa was once abundant in the 100 rivers of Bangladesh. Fishers used to catch plenty of fish, which were sold fresh to local and urban markets. It was cheap and affordable for the poor. From the 1970s, the Hilsa fishery began to gradually decline, with output reaching a low point of 0.19 million tonnes in 1991–1992. This situation was attributed to a combination of closure of migratory routes, river siltation, over-fishing, indiscriminate harvesting of brood stocks and juveniles (locally known as jatka), use of fishing nets with very small mesh sizes, the mechanisation of fishing gear, increased numbers of fishers, pollution, and hydrological and climatic change.

Such a significant decline in Hilsa catches prompted the government of Bangladesh to declare five sites in the country's coastal rivers as Hilsa sanctuaries, restricting fishing during the breeding season. To compensate for loss of earnings due to fishing restrictions, the government started providing affected fisher communities (187,000 households) with 30 kilograms of rice per household per month and supporting alternative income-generating activities (AIGAs). While no study has been carried out to systematically or rigorously evaluate the ecological and social impact of the intervention, it is widely believed by both scientists from the department of fisheries, and the fishers themselves, that it has had significant positive ecological impacts.

The significance of this scheme is twofold. First, it is locally financed without external support; and second, it is operating in a developing country context –often regarded as too challenging a context for such schemes. This case study offers replicable lessons for the implementation of direct economic incentive mechanisms for sustainable fisheries management in developing countries and more widely.

Despite its apparent success, the design and implementation of the scheme could be improved. We recommend:

1. Improving the understanding of the complex socio-economic and ecological systems underpinning the Hilsa fishery.

2. Identifying the beneficiaries of the scheme (the 'buyers' of the ecosystem service) to enable it to be put on a sustainable financial footing.
3. Identifying how fisher communities would prefer to receive their compensation packages and redesigning them accordingly.
4. Empowering local fishermen to monitor and enforce compliance.
5. Improved regional co-operation between the three countries which make up the Bay of Bengal: Bangladesh, India and Myanmar.

One of the critical conditions for success is ensuring the financial sustainability of the economic incentive mechanism. There are several examples of terrestrial PES schemes that have collapsed after donors withdraw or external funding ends. Having a sustainable funding source is even more critical in low-income countries such as Bangladesh where the government is often financially constrained. It is important to have an innovative approach in place to ensure the financial sustainability of the scheme. One such approach could be the establishment of a conservation trust fund which generates financial resources by earmarking export taxes or charging beneficiaries for the sustainable management of the fishery resources. This can only be done after clearly mapping and identifying those affected (ecosystem service providers) and those who are beneficiaries of the scheme (ecosystem service consumers).

Checklist for submission

	Check
Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	Yes
Is your report more than 10MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	No
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Yes
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	No
Have you involved your partners in preparation of the report and named the main contributors	Yes
Have you completed the Project Expenditure table fully?	Yes
Do not include claim forms or other communications with this report.	