



Darwin Initiative Final Report

To be completed with reference to the Reporting Guidance Notes for Project Leaders (<http://darwin.defra.gov.uk/resources/>) it is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

Darwin project information

Project Reference	20-015
Project Title	Economic incentives to conserve hilsa ¹ fish (<i>Tenualosa ilisha</i>) in Bangladesh
Host country(ies)	Bangladesh
Contract Holder Institution	International Institute for Environment and Development (IIED)
Partner Institution(s)	Bangladesh Centre for Advanced Studies (BCAS) and Bangladesh Agricultural University (BAU)
Darwin Grant Value	£208,316
Funder (DFID/Defra)	DFID
Start/End dates of Project	Start date: 04/2013 End date: 03/2016
Project Leader's Name	Essam Yassin Mohammed
Project Website/blog/twitter	http://www.iied.org/bangladesh-protecting-hilsa-overfishing
Report Author(s) and date	Essam Yassin Mohammed; Liaquat Ali; and Zoarder F Ahmed

1 Project Rationale

The hilsa (*Tenualosa ilisha*) fishery is by far the largest single species fishery in Bangladesh; providing full time employment for about 450,000 'professional' fishers and 2.5 million part time fisher folk. Hilsa 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 hilsa 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 hilsa 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 (recently increased to 40kg) 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.

¹ Hilsha and hilsa are often used interchangeably. However, the project team has agreed to use the most widely used spelling – *hilsa*.

The research team aimed to generate information to inform the decision-making process through:

1. **Ecological and socioeconomic assessments.** Ecological baseline assessments aimed to better understand the current complex marine biodiversity and how the ecosystems function, and encompassed biological, physical and chemical characteristics of the fish and their habitat. Socioeconomic characteristics of the fishing communities were also analysed to better understand how people are making a living from fishing. Social baseline assessments included identifying key stakeholders to be interviewed to find out their preferences for how they will be compensated for not fishing, and the types of compensation they prefer.
2. We assessed both the **technical and institutional capacity** of relevant government authorities and communities. Once the assessment is completed we will identify the necessary institutional structures that need to be in place to ensure that a properly functioning payment mechanism is sustained after the project ends.
3. We designed **equitable benefit distribution systems** that aimed to both fairly and equitably distribute payments and conserve biodiversity. This component of the research project shed light on “who gets what and why?”
4. **National hilsa conservation fund.** The government earns an average of \$630 million – a considerable sum – from hilsa exports annually. Earmarking tax revenue for the scheme and/or an additional levy on exports through private sector engagement were also explored in order to ensure the financial sustainability of the compensation scheme.

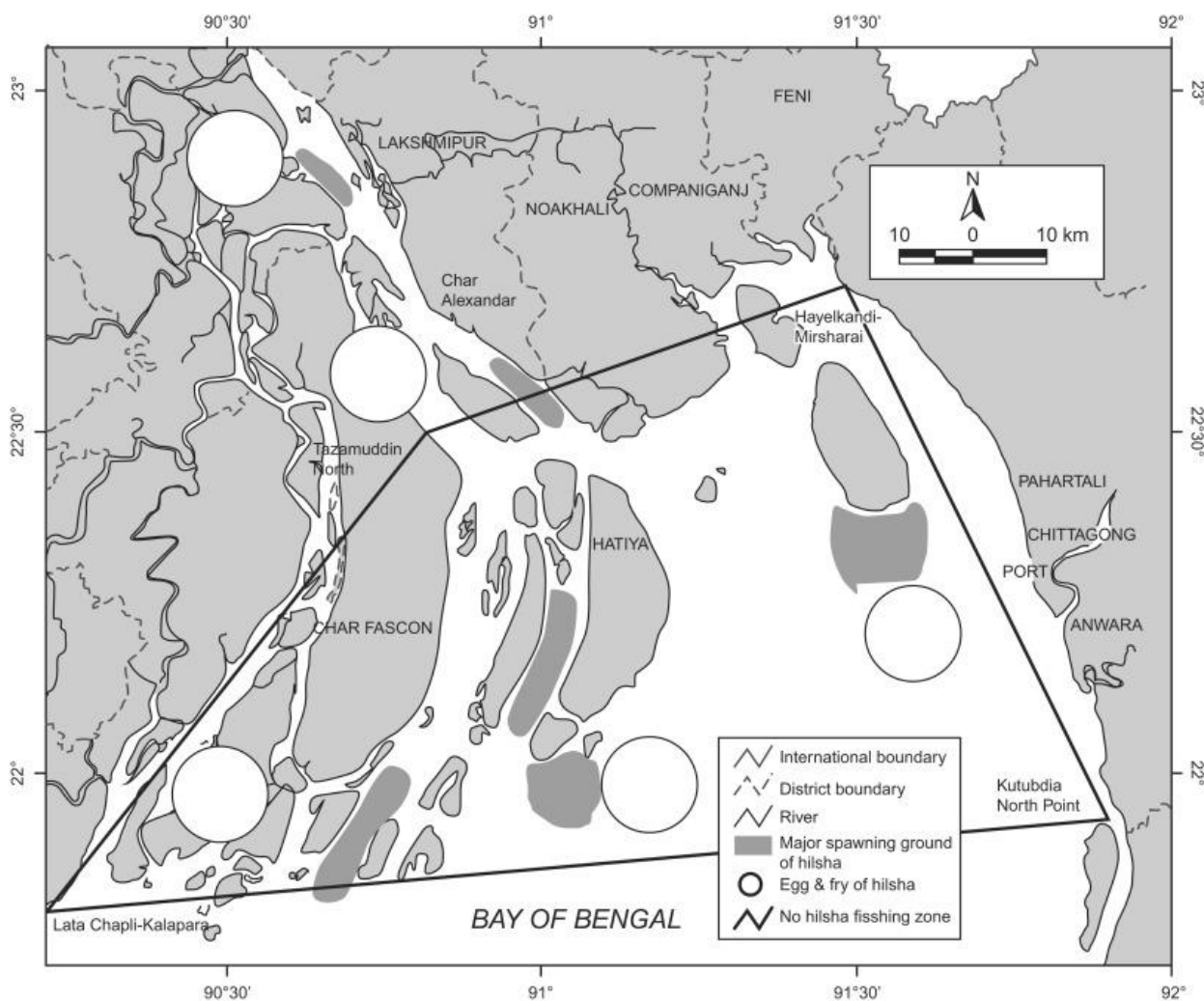


Figure 1 Project site and hilsa sanctuary map.

2 Project Achievements

2.1 Outcome

Outcome:	By the end of the project, an improved mechanism for ensuring sustainable management of hilsa 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 contribute 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.		
	Baseline	Change by 2016	Source of evidence
Indicator 1 Increased number of “impacted” households and individuals involved in the payment scheme	187,000 households during the project period	224,000 households by the end of the project period. This is equivalent to an increase by almost 20%	Please see news article: http://www.ipsnews.net/2016/04/conserving-the-hilsa/
Indicator 2 Equitable benefit distribution system reflects the preference of the fisher communities	No equitable benefit sharing mechanism in place	Principles of equitable benefit sharing mechanism was developed. The document which was mutually agreed by DoF and representatives of the fisher communities clearly mentions the need to assess preferences of recipient communities before compensation packages are determined.	Principles of equitable benefit sharing mechanism can be found in the hilsa knowledge basket (submitted with this report).
Indicator 3 A sustainable national Hilsha fish conservation fund to finance the scheme fits existing institutional and technical capacity	Existing scheme is funded by the Government of Bangladesh. Financial sustainability of the scheme was susceptible to regime change.	A business plan and Memorandum and Articles of Association of a National Hilsa Conservation Fund have been developed and duly submitted to the Ministry of Fisheries and Livestock. Strong government buy in.	See this news article: http://www.iied.org/conservation-trust-fund-proposed-help-manage-bangladesh-fish-stocks Please also see lessons learned section of the report. (Section 5)
Indicator 4 Exploitation rate (ER) of Hilsha	ER: 0.66	By the end of the project period, hilsa catch has increased by 11%. Catch per unit effort	Please see news article.

fishery in the lower Meghna reduced to optimal level (0.5)		(CPUE) has also increase from 3 – 8 kg to 5 – 8 kg per hour per 100 metres long and four metres wide net. This is a significant recovery of the fish stock.	https://www.thethirdpole.net/2016/04/14/the-return-of-the-king/
Indicator 5 The project outputs influence decision making process in Bangladesh and beyond.	Lack of science-based hilsa management.	Through this project, we were able to introduce amendments to two policies, namely: (1) the Protection and Conservation of Fish Act, 1950 (Act No. XVIII of 1950) and, (2) the Marine Fisheries Ordinance, 1983 (Ordinance No. XXXV of 1983). Please see Section 5.	Copies of amended sections of these policies available up on request. Also see Section 5 for detail.

2.2 Impact: achievement of positive impact on biodiversity and poverty alleviation

Impact statement from logframe:

In the longer term, hilsa 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.

Please see Sections 4.2 and 4.3. (Extensive explanation provided below)

2.3 Outputs

Output 1:	Improved understanding of current ecological and socio economic characteristics of hilsa fishery		
	Baseline	Change recorded by 2016	Source of evidence
Indicator 1.1	Very limited knowledge on biology and ecology of hilsa fishery – particularly in the wake of climate change and increased habitat change.	State of the art biophysical and chemical assessments of hilsa fishery was done. This was first of a kind to be conducted in Bangladesh in at least 3 decades.	Please see the following reports: Food and feeding ecology of hilsa (<i>Tenualosa ilisha</i>) in Bangladesh's Meghna River basin http://pubs.iied.org/16609IIED.html?c=fish The biophysical assessments of the hilsa fish (<i>Tenualosa ilisha</i>) habitat in the lower Meghna, Bangladesh http://pubs.iied.org/16605IIED.html?c=fish
Indicator 1.2 (also applicable to Indicator 1.4)	Limited (if any) understanding on the cost of the policy intervention and cost of running the scheme.	A comprehensive study that assess the cost of compensation including administrative and transaction cost was completed.	Please see the following report: The cost of compensation: Transaction and administration costs of hilsa fish management in Bangladesh http://pubs.iied.org/15522IIED.html?c=fish

Indicator 1.3	Limited (if any) understanding of the preference of the recipient communities.	A study to assess preferences for compensation package using choice experiment was conducted and effectively communicated with stakeholders.	Please see: http://www.slideshare.net/IIEDslides/assessment-of-preferences-hilsa-bioecon2014
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Output 2:	Improved understanding of institutional capacity needs, opportunities and gaps to ensure the effective management and functioning of the repayment scheme		
	Baseline	Change recorded by 2016	Source of evidence
Indicator 2.1	No documented study on assessment of legal and institutional framework	Legal and institutional frameworks were reviewed; gaps identified and some concrete policy recommendations were made.	Please see this article: http://www.sciencedirect.com/science/article/pii/S0308597X1600049X
Indicator 2.2	Lack of clearer understanding of capacity gaps		
Indicator 2.3	Lack of systematic capacity building action plan.	Based on the above study, capacity building action plan and strategy was developed and submitted to DoF.	The document is available up on request.

Output 3:	Enhanced engagement between the Department of Fisheries and fisher communities in the lower Meghna		
	Baseline	Change recorded by 2016	Source of evidence
Indicator 3.1	No previous dialogue on benefit sharing system.	Information gathered from outputs 1 and 2 were used to develop principles of benefit sharing system. A rigorous analysis on targeting has been completed. In addition, a medium-scale survey with 230 households has been conducted to assess 'who gets what and why?' We were advised to conduct the additional survey by	Please see Annual Report 2.

		the senior officials from DoF following the multistakeholder workshop on equitable benefit sharing that was held in the DoF Conference Room in Matshya Bhaban, Dhaka on the 19 th of January 2015. The workshop was attended by 60 participants including senior government officials, District Fisheries Officers, academics and representatives of the fisher communities	
Indicator 3.2	Terms of benefit distribution system are agreed by both the implementing governmental agency (DoF) and the impacted communities	A final document on principles of benefit sharing system was developed and mutually agreed by DoF and representatives of hilsa fisher communities.	Principles of Benefit Sharing document available upon request.

Output 4:	Sustainable national Hilsha conservation fund proposed and agreed by DoF		
	Baseline	Change recorded by 2016	Source of evidence
Indicator 4.1	Sustainable financing mechanism for hilsa fishery management was not in place. Current financing scheme (using government revenue) was deemed to be susceptible to political instability (e.g. regime change).	By the end of the project period, a background document that makes a business case for the establishment of hilsa conservation fund was prepared	Background document and MAoA are provided along with this report. (Please see Hilsa Knowledge Basket)
Indicator 4.2		In addition to the background document, a Memorandum and Articles of Association of the conservation fund was prepared, revised, and submitted to the DoF.	

Indicator 4.3		Consultation workshop with DoF and other relevant stakeholders was conducted on 11 June 2015.	Please see press release http://www.iied.org/conservation-trust-fund-proposed-help-manage-bangladesh-fish-stocks
Indicator 4.4		The documents were further revised and re-submitted to the Ministry of Fisheries and Livestock.	Background document and MAoA are provided along with this report. (Please see Hilsa Knowledge Basket)

Output 5:	Project outputs are disseminated to influence decision making in Bangladesh and beyond		
	Baseline	Change recorded by 2016	Source of evidence
Indicator 5.1	Number of workshops, research outputs, news articles and press releases	<p>Extensive knowledge products were produced and widely disseminated.</p> <p>In addition, the following workshops and international events were held:</p> <ul style="list-style-type: none"> Inception workshop: <p>International Conferences:</p> <ul style="list-style-type: none"> 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 	<p>Publications:</p> <p>Balancing carrots and sticks: incentives for sustainable hilsa fishery management in Bangladesh http://pubs.iied.org/16619IIED.html</p> <p>Payments for coastal and marine ecosystem services: prospects and principles http://pubs.iied.org/17132IIED.html?c=fish</p> <p>Payments for ecosystem services in developing world fisheries http://onlinelibrary.wiley.com/doi/10.1111/faf.12095/pdf</p> <p>Economic incentives for sustainable hilsa fishing in Bangladesh: An analysis of the legal and institutional framework http://www.sciencedirect.com/science/article/pii/S0308597X1600049X</p> <p>Direct economic incentives for sustainable fisheries management: the case of Hilsa conservation in Bangladesh http://pubs.iied.org/16527IIED.html?c=fish</p> <p>Economic incentives for sustainable hilsa fish management in Bangladesh: An analysis of the legal and institutional framework http://pubs.iied.org/15523IIED.html?c=fish</p> <p>The cost of compensation: Transaction and administration</p>

		<p>research and practice 21 March in Edinburgh, UK</p> <ul style="list-style-type: none"> ▪ The 16th Annual BIOECON Conference on Biodiversity, Ecosystem Services and Sustainability, 21-23 September 2014, Kings College, Cambridge, United Kingdom. ▪ Seminar at the FAO HQ, Rome on the 19th of September 2014. ▪ Rethinking Capitals: Going beyond the financial Blogs and press-releases, 17 December 2014 ▪ Bangladesh Agricultural University Research System (BAURES), 25-26 January 2015, Mymensingh, Bangladesh ▪ European Development Days, 2 – 4 June 2015, Brussels, Belgium ▪ Indian Ocean Summit, 1 – 5 December, 2015, Goa, India. ▪ International Institute of Fisheries Economics and Trade (IIFET) Conference, 11 - 15 July 2016, Aberdeen, 	<p>costs of hilsa fish management in Bangladesh http://pubs.iied.org/15522IIED.html?c=fish</p> <p>A Review of Conservation Trust Funds for Sustainable Marine Resources Management: Conditions for Success http://pubs.iied.org/16574IIED.html?c=fish</p> <p>Incentive-based Hilsa fish conservation and management in Bangladesh: prospects and challenges http://pubs.iied.org/G03688.html?c=ec on</p> <p>Mitigating unintended local economic impacts of the compensation scheme for hilsa management http://pubs.iied.org/pdfs/17282IIED.p df</p> <p>Food and feeding ecology of hilsa (Tenuailosa ilisha) in Bangladesh's Meghna River basin http://pubs.iied.org/16609IIED.html?c=fish</p> <p>Protecting ecosystems and livelihoods http://pubs.iied.org/17199IIED.html?c=fish</p> <p>The biophysical assessments of the hilsa fish (Tenuailosa ilisha) habitat in the lower Meghna, Bangladesh http://pubs.iied.org/16605IIED.html?c=fish</p> <p>IIED Blogs and news articles:</p> <p>UK's Darwin Initiative funded project strives to reduce threats to hilsa fish http://www.iied.org/uks-darwin-initiative-funded-project-strives-reduce-threats-hilsa-fish</p> <p>Five ways to boost stocks of the Bay of Bengal's beloved hilsa fish http://www.iied.org/five-ways-boost-stocks-bay-bengal-s-beloved-hilsa-fish</p> <p>Compensation for conservation of Bangladesh's national fish http://www.iied.org/compensation-for-conservation-bangladesh-s-national-fish</p> <p>Bangladesh: protecting the Hilsa</p>
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		Scotland	<p>from overfishing http://www.iied.org/bangladesh-protecting-hilsa-overfishing</p> <p>Protecting ecosystems and livelihoods in Bangladesh http://www.iied.org/protecting-ecosystems-livelihoods-bangladesh</p> <p>Want to know how to save a fish species? Ask a fisher http://www.iied.org/want-know-how-save-fish-species-ask-fisher</p> <p>Can we save our fisheries with lessons from our forests? http://www.iied.org/can-we-save-our-fisheries-lessons-our-forests</p> <p>Environmental Funds: sustainable finance for conservation http://www.iied.org/environmental-funds-sustainable-finance-for-conservation</p> <p>Conservation trust fund proposed to help manage Bangladesh fish stocks http://www.iied.org/conservation-trust-fund-proposed-help-manage-bangladesh-fish-stocks</p> <p>Scientists call for international collaboration to safeguard hilsa fish stocks http://www.iied.org/scientists-call-for-international-collaboration-safeguard-hilsa-fish-stocks</p> <p>Video</p> <p>Balancing carrots and sticks. https://youtu.be/gYor_Xcuzhg</p>
Indicator 5.2	Limited dialogue on transboundary hilsa fishery management in the Bay of Bengal	Regional Seminar that brought delegates from Myanmar, India and Bangladesh was held 4-5 May 2016 to discuss transboundary hilsa fishery management	<p>Please see this news article: http://www.iied.org/scientists-call-for-international-collaboration-safeguard-hilsa-fish-stocks</p>

All knowledge products (including a short video) are consolidated in a hilsa knowledge basket (in a USB stick) and was widely distributed among key stakeholders in Bangladesh, Myanmar and West Bengal State in India.

Hilsa Knowledge Basket:

Incentive-based hilsa fish (*Tenualosa Ilisha*) management in Bangladesh (Darwin-Hilsa Project)

The hilsa fish is of national importance to Bangladesh. But increased demand for the fish has led to pressure on the fish species. Not only is the hilsa in trouble, but so are the 3 million fishermen, fisherwomen and fishery workers who directly or indirectly depend on the fish for their livelihood.

This has prompted the government to declare five areas as sanctuaries for the fish. In return for not fishing in these areas affected fishing communities or households are rewarded with sacks of rice and provided with alternative income generating activities to replace the lost income.

In March 2013, IIED, 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, launched a Darwin-Initiative funded project that aimed to fill knowledge gaps and recommend policy options and thereby enhance the effectiveness of the incentive-based scheme.

▶ Published articles

▶ Blogs and news articles

▶ Short video

implemented by:



funded by:

in partnership with:

Figure 2 Hilsa Knowledge Basket user interface (sample available up on request).

3 Project Partnerships

Since the project inception phase, we were able to establish a strong partnership portfolio with host-country based institutions namely BCAS and BAU. And most importantly, we also developed a close partnership with the Department of Fisheries (DoF) of the Ministry of Fisheries and Livestock.

The IIED team maintained its role for designing the socioeconomic studies, and drawing on experiences of the use economic incentives for fisheries management from around the globe to ensure best practice in relation to effectiveness, equity, efficiency and financial sustainability. The IIED team also played a major role in ensuring excellence and rigour in the research methods employed, and that the research is policy relevant. Most importantly, the team was responsible for ensuring that the project activities and outputs are delivered in a timely manner. Some of the most important contributions of the IIED team were (1) developing a rigorous methodology to assess the preferences of the recipient communities for compensation packages using the choice experiment method (CEM); (2) drawing lessons on the use of conservation trust funds for natural resources management; and (3) ensuring the quality and policy relevance of the knowledge products; particularly, linking both socioeconomic and ecological studies to policy processes.

The BCAS team was responsible for revising the socioeconomic research methodologies to ensure that cultural sensitivities and other local factors are taken into consideration. The team also led the execution of field work and managing a team of qualified enumerators. The BCAS team was also instrumental in periodically briefing officials from DoF about the research progress.

One of the most commendable traits of the BCAS team was their genuine desire to overcome challenges associated with limited resources and not compromise the quality of the research. For instance, given the availability of resources (and estimating confidence intervals and sample means) the project team had agreed that 750 households would be surveyed. After the completion of the survey, the team realised that surveying additional 230 households was inevitable. The BCAS team utilised their internal resources to cover the cost of the additional (and unbudgeted) survey. This is a clear manifestation that the team is genuinely keen to deliver (to use their phrase) “world-class research” and ensure they are effectively communicated to policy makers.

The BAU team led on the ecological/biological component of the project. Their highly qualified team of fisheries scientists has designed the research methodology and collected extensive dataset which has led to the production of three scientific reports which are due to be submitted to academic journals.

Similarly, the BAU team has also utilised its internal resources to cover the deficit from the budget allocated for capital equipment. The cost of buying a microtone and other fieldwork equipment (e.g. salinometer etc.) were significantly underestimated. The BAU team mobilised internal resources to offset the deficit (equivalent to \$7000) and eliminated the risk of compromising 'research excellence', which is the core value of this project.

The partnership with the DoF has been very good throughout the project period and described my many as 'exemplary'. The Director General of DoF, Mr Syed Arif Azad in particular has been very keen in learning more about the project and expressing his willingness to incorporate the outputs (policy recommendations) of the project in improving the compensation scheme. The briefing meeting that was held at the conference hall of the DoF on the 19th of January 2015 was requested by the Mr Azad. Please see press release: <http://www.iied.org/uks-darwin-initiative-funded-project-strives-reduce-threats-hilsa-fish>

One of the positive outcomes of the project has been establishing an informal ad-hoc group of fisheries scientists, conservationists, and fisheries managers. This is evident in the larger USAID-funded project which involves all project partners associated with the Darwin-Hilsa project.

Lessons learned from the Darwin-Hilsa project were shared with regional counterparts in Myanmar and West Bengal State of India. This was done in a regional seminar that was held in May 2016. (<http://www.iied.org/scientists-call-for-international-collaboration-safeguard-hilsa-fish-stocks>). This has led to further discussion regarding the development of a 'transboundary' hilsa fishery management in the Bay of Bengal. We will continue to work with all concerned stakeholders from the three countries to realise this ambition.

4 Contribution to Darwin Initiative Programme Outputs

4.1 Contribution to SDGs

At the request of the Ministry of Fisheries and Livestock and other relevant stakeholders, the project team was requested to assess the relevance of the project to the sustainable development goals (SDGs). In October 2015, the project team and fisheries scientists held an informal meeting to map the extent to which the project can contribute towards achieving the SDGs.

Actions to manage marine and coastal environments in general and fisheries resources in particular are important cross-cutting component of the SDGs. It was noted that these actions need to focus on (1) identifying and protecting the 'blue' natural foundations of sustainable development, and (2) restoring or enhancing the ability of blue natural assets to provide valuable goods and services.

The 2030 Agenda places primary responsibility for taking such action on national governments, who have committed to work in partnership with other stakeholders, and with other governments in the many contexts where management of marine and coastal environments transcends national boundaries. It was agreed that the project has contributed towards achieving Goal 14 of the SGDs in two broad ways:

- a. **Management measures for blue natural assets** – these include better planning of economic and infrastructure development, protection and spatial management of fisheries resources, efforts to minimise pollution and waste from diverse marine and terrestrial sources, and use of economic and fiscal incentives to encourage more sustainable marine and coastal management.
- b. **Enabling conditions for good management** – including capacity building and efforts to reform laws, policies and institutions, relating to: hilsa fishery management, responsibilities and decision-making, measurement, assessment and accounting for blue natural assets, frameworks that connect and leverage diverse sources of finance across public, private and third sectors, and more equitable allocations of socio-economic benefits flowing from sustainable fisheries management.

4.2 Project support to the Conventions or Treaties (CBD, CMS, CITES, Nagoya Protocol, ITPGRFA)

Biodiversity conservation in general and working closely with the Government of Bangladesh to meet its obligations under the CBD is central to our project. We have been working closely with the Secretary of the Ministry of Environment and (by default) CBD focal point.

6th sanctuary

One of the most notable achievement of this project is that owing to the biophysical study that was conducted and effective communication with the DoF, the government is now considering demarcating an additional (sixth) sanctuary based on the findings from this project. The 6th sanctuary will be at the confluence of the three tributaries of the Meghna River, between Hijla and Mehendiganj in Barisal district. As mentioned in the previous section, this has been reported by the DhakaTribune and can be found at:

<http://www.dhakatribune.com/bangladesh/2015/jan/20/country%E2%80%99s-6th-ilish-sanctuary-coming-soon#sthash.PPag7mnk.dpuf>

Extending to the marine environment

While the sanctuaries are in riverine and estuarine systems, we have persistently argued that there is urgent need to extend the protected areas to marine and coastal environments. We believe that the development of Marine Protected Areas (MPAs) is an effective tool for biodiversity conservation and the restoration of fish resources. Since hilsa is an anadromous migratory fish and a notable portion of its life cycle is spent in the sea, the establishment of a Marine Protected Area (MPA) in the Bay of Bengal for the conservation of hilsa and resources deserves immediate action.

The Darwin-Hilsa project team put forward a proposal to introduce a seasonal no-take in the marine environment to complement the protection for hilsa in the riverine systems. Extensive discussions with the government, and engagement with the research arm of the Ministry of Fisheries and Livestock, convinced them to amend their policy and ban all fishing in this marine zone – not only for Hilsa but any kind of fish – for about two months from 20 May to 23 July. This has contributed to the achievement of Aichi Targets, which calls up on countries to declare 10 per cent of its marine areas as a protected area. (Please see Section 5).

4.3 Project support to poverty alleviation

Direct impacts

Hilsa is the most important single-species fishery in Bangladesh. The sector employs nearly half a million full-time and 2.5 million part-time workers, making up around a quarter of the Bangladesh fisheries sector. It is evident that fisher communities are among the poorest and most marginalised section of the society in Bangladesh. It is vital that this industry has a sustainable future which supports the people involved and allows fish stocks to recover.

Unlike in many other countries that resort to command-and-control measures to manage their fisheries resources and deprive the fishers of their livelihoods, the Government of Bangladesh has introduced a rare example of compensation scheme to alleviate the short-term cost of fishing restrictions borne by poor fisher communities. Therefore, through effective targeting (inclusivity) and delivering compensation that meets the demands of the poor fisher households (equity), we believe our project has contributed to enhancing the effectiveness of the scheme.

The DoF has increased the beneficiaries from 187,000 (during the start of the project) to more than 224,000 (by the end of the project period). Moreover, the amount of rice provided to each household has been increased from 30kg to 40kg per household per month.

Indirect impacts

We also worked with the DoF to mitigate or eliminate any unintended consequences of the compensation scheme on the local economy.

Lessons from similar social protection schemes show that in-kind compensation (such as rice) may have some unintended negative socioeconomic consequences or 'externalities'. The unintended effects are seldom identified by impact evaluation studies and consequently they

remain largely unaccounted for in policymaking. For example, 'compensation' for hilsa fishery closures may distort local rice prices for farmers and retailers. Prices might be pushed down as more rice is available and/or there is less demand for locally bought rice. So compensating fishers might disadvantage other sections of the community, possibly reducing overall societal wellbeing. Similarly, fishers who stop fishing for several months are likely to look for other work, causing knock-on effects to the local labour market that can cause local conflict. And when a whole economic group suffers a long gap in regular income, local finance and credit markets can be affected too.

The following policy recommendations were made to mitigate such effects:

- Incentive-based fisheries management schemes must carefully assess potential unintended impacts beyond the fishery itself — in this case distortions in the local rice, labour and microfinance markets. Schemes will succeed in this if there are no (or negligible) 'spill-over' disadvantages for local producers, retailers and labourers, and no related rise in local interest rates.
- Unintended impacts such as fluctuations in the price of rice will be less likely if 'in kind' compensation for fisheries closures is sourced locally. Compensation schemes should either buy locally produced rice or issue vouchers for local purchases — perhaps limited to specific sub-districts or villages. Sourcing compensation locally could stimulate the local economy and should reduce transport and distribution costs for the scheme.
- To avoid seasonally flooding local labour markets, compensation schemes should consider offering fishers alternative paid work during the ban — perhaps to build a new community asset — or labour-intensive alternative income-generating activities.
- Microfinance should be introduced and tailored to meet the needs generated by a fishing ban. This must include a 'grace period' that protects fishers from repaying capital or interest when the fishery is closed, which would in turn boost compliance with the ban. Well-thought-out microcredit should gradually liberate hilsa fishers from a cyclical debt trap and prevent the interest rates they pay rising when the fishery is closed.

4.4 Gender equality

Our research approach has persistently ensured that women are adequately consulted and their opinions reflected in our analysis of the socioeconomic studies. One of the main drawbacks of failing to consult women in such compensation schemes is that it may lead to ineffectiveness or inefficiency of the compensation provided. For instance, before the beginning of this research project, the DoF has provided some women with sewing machines as part of the compensation package. The objective was to provide them with an alternative income generating activity particularly during the ban period. However, most of the women did not know how to use the sewing machines and therefore sold them in the market and utilised the cash to pay for non-productive consumables.

Therefore, defying traditional belief that fishermen only should be consulted as they pause the main threat to the fishery, we have ensured that adult female subjects are consulted both in our household survey and focus group discussions. Therefore, the preferences of women and impacts of the compensation 'type' on the wellbeing of women was carefully assessed and reflected in the 'principles of equitable benefit sharing' document. Please see 'principles of equitable benefit sharing' document.

4.5 Programme indicators

- Did the project lead to greater representation of local poor people in management structures of biodiversity?

One of the unique features of the project was the fact that extensive consultations with more than 2000 fisher households were conducted. Our research design and output were chiefly informed by our target population.

Defying traditional hierarchies and power structures, we were able to involve representatives of fisher communities in all workshops and dialogues held with senior government officials.

- Were any management plans for biodiversity developed?

Two policy amendments were proposed and endorsed by the government. Please see Section 5 below.

- Were these formally accepted?

Please see Section 5 below.

- Were they participatory in nature or were they 'top-down'? How well represented are the local poor including women, in any proposed management structures?

As mentioned above, more than 2000 households were consulted through household survey and focus group discussions. Our research project (its design and implementation) was highly consultative.

- Were there any positive gains in household (HH) income as a result of this project?
- How many HHs saw an increase in their HH income?
- How much did their HH income increase (e.g. x% above baseline, x% above national average)? How was this measured?

[Relevant to 3 bullet points above]

The project has worked very closely with the Government of Bangladesh to increase the level of rice compensation from 30Kg per month per household to 40Kg per month per household. The government is also considering doubling the compensation level to 80Kg. In addition, the number of fisher households included in the compensation scheme has increased from 187,000 to 224,000.

4.6 Transfer of knowledge

Did the project result in any formal qualifications? Yes

- i. How many people achieved formal qualifications?
Two individuals earned their PhD through their involvement in the project.
Kaisir Hassan, Bangladesh Agricultural University (Bangladesh)
Annabelle Bladon, Imperial College London (UK)
- ii. Were they from developing countries or developed countries?
Bangladesh (developing country)
United Kingdom (developed country)
- iii. What gender were they?
Kaisir (male)
Annabelle (female)

4.7 Capacity building

All project partners, fisheries managers, and fisher community members were involved in the design and execution of the research project. Most of the research products were authored or co-authored by scientists from host-country organisations. This can be used as a demonstration of genuine partnership and capacity building efforts of the project.

As mentioned earlier, Mr Kaisir Hassan, Assistant Director of DoF has completed his PhD dissertation as part of the Darwin-Hilsa project. He has led on the production of three manuscripts namely: feeding behaviour of hilsa fish, spawning seasonality of hilsa fish, and biophysical assessment of hilsa habitat in the lower Meghna Basin.

Moreover, enumerators from BCAS (12 in total) received a 3 day training on 'assessment of preferences using the choice experiment method.' They also received training on 'bias and sources of biases. These training sessions were highly valued by BCAS.

Research outputs (including academic articles) were finally consolidated in a 'hilsa knowledge basket' which was then widely disseminated among relevant stakeholders.

4.8 Sustainability and Legacy

The Darwin Hilsa Project, as is commonly known in Bangladesh and can be seen from the workshop report submitted along with this report, has attracted a number of other organisations and donors to work on 'incentive-based' hilsa management. For instance, the International Union for the Conservation of Nature (IUCN) has been echoing the findings and recommendations of our research project over the last fiscal year. A recent press coverage by The Independent citing participants of a workshop organised by IUCN in October last year states that "[Sic.] ...building a Hilsa Conservation Fund through innovative policy measures can boost hilsa production by ensuring sustainable incentive-based conservation... considering one per cent tax on hilsa export." This is a clear manifestation that our project has been having an impact on policy debate with regard to hilsa conservation in Bangladesh.

The Darwin Hilsa Project has also inspired USAID to develop a \$15,000,000 EcoFish^{BD} project. The project is being implemented by WorldFish Bangladesh. IIED is one of the partners helping with the research component of the project. The EcoFish project will help fill some of the knowledge gaps (e.g. counterfactual impact evaluation of the compensation scheme) and ensure successful implementation of the recommendations made by the Darwin project over the next five years. One of the intermediate results (IRs) of the EcoFish project focuses on 'an effective and sustainable incentive mechanism for hilsa conservation'. USAID is considering putting 'seed money' to the Hilsa Conservation Fund, subject to ratification of the conservation fund by the Government of Bangladesh. IIED and WorldFish have signed both Memorandum of Agreement (MoA) and Memorandum of Understanding (MoU). Both documents are available upon request.

To ensure continued government buy in and collaboration, Mr Kaisir Mohammad Moinul Hasan, Assistant Director of DoF, has been enrolled in a PhD programme at BAU. He has played a leading role in data analysis and writing 3 scientific papers. He has since completed his PhD dissertation and awaits his viva.

Moreover, the Darwin-hilsa project has also played a major role in fostering a transboundary dialogue on sustainable hilsa management in the Bay of Bengal. In May 2016, delegates from Myanmar and India (West Bengal State) were invited to a regional workshop that was held in Dhaka. At the regional workshop, scientists and fisheries managers from three countries called for an enhanced collaboration between the countries and the development of a common hilsa management system. The IIED team is exploring funding opportunities for the establishment of a similar incentive-based hilsa management in Myanmar.

Beyond the Bay of Bengal, research outputs and key lessons learned were shared with key stakeholders in Costa Rica and Mozambique. This was done at the request of responsible authorities from both countries.

The project leader has also worked closely with FAO's task team on 'payments for ecosystems services in fisheries and aquaculture' and the lessons learned from the Darwin-Hilsa project are featured in a dedicated chapter in their forthcoming book. Therefore, one can conclude that the project has had a measurable impact beyond Bangladesh and the Bay of Bengal and had informed the development of incentive-based fisheries management across the globe.

5 Lessons learned

In this section, we will present two '*episodes of change*' which highlight two main lessons learned, and the process and evidence of change.

Episode of Change 1: Policy amendments

The IIED team in partnership with host-country organisations has been pioneering the use of economic incentives for sustainable management of fisheries resources for the hilsa fishery in Bangladesh. Once abundant, the production of hilsa has gradually declined in Bangladesh since the 1970s, mainly due to overfishing and the degradation of habitats. The Darwin-Hilsa work has been conducted in collaboration with the Department of Fisheries (DoF) of the Government Bangladesh; who in 2003 had declared five sanctuary areas (no-take zones) in the coastal rivers to reduce pressure on the *jatka* (juvenile hilsa) fishery for a period of four months, as well as a fishing ban for a period of 11 days in October to allow the adult hilsa to spawn. The Hilsa Fisheries Management Action Plan (HFMAP) provides compensation to poor fishers in the form of rice and support for alternative income generating activities (AIGA) in return for complying with the regulations for the *jatka* fishery. Incentive-based schemes are widely used to conserve natural resources, such as forests and watersheds, but the Bangladesh programme is a rare example employed for sustainable fisheries management.

By the end of the project period, the team has helped bring about two key policy amendments to the **Protection and Conservation of Fish Act, 1950 (Act No. XVIII of 1950)** and the **Marine Fisheries Ordinance, 1983 (Ordinance No. XXXV of 1983)** as part of the Darwin Initiative funded 'Economic Incentives to Conserve Hilsa Fish' project. The first relates to the 11-day closure period for the peak spawning of the adult hilsa.

Research conducted with the Bangladesh Agricultural University (BAU) on spawning seasonality, and the reproductive cycle of the hilsa fishery, found that the peak season for spawning was in fact much longer – as much as 25-30 days. The SMG then argued for a longer closure period to allow more successful spawning and a more productive fishery in the long-term. Taking the research into consideration, the Department of Fisheries agreed to an increase of 15 days during the Bangladesh month of *Ashvin* (October) on the basis that it would be extremely difficult for the fishers to cooperate if the ban was for longer than that. (There is no compensation provided during the adult hilsa ban period). The project team continued to provide evidence and the government has now agreed to ban adult hilsa fishing for 22 days of spawning – i.e. doubling the initial ban period – and at the same time is considering the team's request that they also provide compensation for the most vulnerable fishers at this time.

The second policy amendment relates to the Marine Fisheries Ordinance – the legislation enforceable by local authorities to ensure the management, conservation and development of marine fisheries in Bangladesh. Recognising that the existing management for hilsa focused on the riverine system (hilsa are migratory species moving from freshwater to seawater), the project team put forward a proposal to introduce a no-take seasonal zone in the marine environment to complement the protection for hilsa in the riverine systems. Extensive discussions with the government, and engagement with BFRI, the research arm of the Ministry of Fisheries and Livestock, convinced them to amend their policy and ban all fishing in this marine zone – not only for hilsa but any kind of fish – for about two months from 20 May to 23 July.

These two official policy amendments (written in Bengali) are now documented and approved, and represent a significant achievement. To encourage government and fisher acceptance of the ecologically focused policy amendments, field-oriented applied socio-economic research has also looked at how to resolve the compensation-scheme issues. To make the programme more effective and sustainable, it was necessary to look beyond the initial scope of the project and address the non-fishing stresses and threats, such as heavy indebtedness. Greater financial inclusion is now being planned.

2. How the change has occurred: how and what IIED activities have contributed

The core project partners with the IIED were the Bangladesh Centre for Advanced Studies (BCAS), and the Bangladesh Agricultural University (BAU), with whom a considerable number of knowledge products have now been jointly published. The BAU team was responsible for the biological and ecological studies—spawning seasonality, the biophysical assessment of the habitat etc.,—and the BCAS team worked on the socio-economic aspects. IIED's team focus was on bringing the economic arguments to bear and targeting the research to policy link—i.e. bridging development research with development policy—and area in which IIED specialises.

To bring about incentive-based hilsa fishery management, the SMG explored more equitable cost and benefit sharing. A set of principles for an equitable benefit-sharing fishery was developed as a four-page document. These 32 principles highlighted some of the concerns of the fishers, for example not receiving the right amount of rice compensation. A comprehensive assessment of preferences for the compensation package was undertaken on the basis that to ensure fishers comply with regulations they must be happy with the whole scheme. Although initially they had been receiving 30kgs of rice per household for the 4 months of the jatka ban, which had then increased to 40kgs, the overwhelming majority stated that the rice compensation wasn't sufficient. Despite there being a budget to cover the costs of transportation and distribution of rice, bureaucracy meant that it was easier for local officials to deduct some of the rice to cover their costs instead. On the basis of the findings of the Darwin-Hilsa project, the Department of Fisheries has now written a proposal to central government arguing that fishers be provided up to 80kgs of rice per household per month – i.e. a doubling – and that local authorities use designated budget line to cover the cost of transportation and distribution.

The *non-fishing related stressor* of heavy indebtedness had been completely overlooked within the HFMAP. No one had anticipated the issue or recognised the gravity of the problems. Limited financial services exclude most fishers from obtaining loans from formal microfinance institutions. Research with fishers revealed how many were being forced to seek loans from informal money lenders (known locally as *aratdars*) during the ban period, when demand for loans can increase by up to 30%—thereby forcing interest rates up by 20-30%. Although beyond the initial scope of the project, this issue was strongly impacting compliance with the incentive-based scheme, and the problem of indebtedness was communicated effectively to the government of Bangladesh. An argument for greater financial inclusion was put forward, i.e. that fishers need to be provided with suitable financial products and services that can work with their very varied and seasonal incomes. Financial products need to include a grace period, as imposing fishing restrictions for four months makes impossible for fishers to service their debts equally over a 12 months period. In offering a more suitable financial product to fishers it is also feasible to add in an ecological element—a lower rate and a grace period being provided as long as there is compliance with fishing regulations. The *Palli Sanchoy Bank* (rural savings bank) is now considering piloting micro finance and credit to fishers and tailoring it to the fishery production cycle. Recommendations within the Hilsa Conservation Trust Fund – the self-governing institution that is set to continue the incentive-based scheme - also provide for this kind of service as well.

3. Evidence of change: stakeholders'/partners' feedback and available documentation

A highly significant, indication of success is the continuation of the work by the Enhanced Coastal Fisheries ECOFISH^{BD} project in Bangladesh funded by USAID and being implemented over 5 years by WorldFish in partnership with the Department of Fisheries. The project team's engagement with USAID early on had helped encourage Washington to approve of a \$15m project to support the hilsa fishery. The SMG is currently involved in knowledge generation component of the ECOFISH^{BD} project whose objectives closely mirror its own, with the project

focused on following up the policy amendments now in place and strengthening the other research work undertaken. An excellent 'exit strategy' for the team, the project is allowing the work to continue, with (for example) the IIED-BCAS team is just completing a study on the economic valuation of hilsa fishery for ECOFISH^{BD}.

4. What have we learnt from this episode of change?

The policy amendments to the Hilsa Fisheries Management Action Plan were a team effort that was aided from the outset by a very positive, forward-thinking attitude. Rather than framing the problems in compliance within an over-fishing 'crisis narrative', the team focused instead on celebrating the successes of the incentive-based scheme of the Government of Bangladesh, and looked for opportunities and research gaps that, once filled, would enable it to function more effectively. This attitude was highly welcomed by the government, who have remained engaged and willing to listen throughout.

Government endorsement of the policy amendments is now evidence that by thinking three dimensionally—and including a political approach—success is more likely. Initiatives should not only care about how to maximise the socio-economic and ecological benefits, but should also be able to deliver some positive political gains if they want to be seen as a valuable proposition.

Certain gaps still remain to be filled. As yet there has not been a rigorous impact evaluation of the incentive based scheme, but the IIED-BCAS will remain involved and do this through ECOFISH^{BD}. The group is also hoping to do some analysis of the whole supply chain in the fishery (covering the middleman, the input providers, the service providers, the retailers, the exporters and the consumers) to identify some of the key constraints and bottlenecks. The hilsa fishery is also important to neighbouring Myanmar and India, who are now benefitting from the pioneering efforts in Bangladesh. A regional seminar in May 2016 shared the lessons learnt and agreed to explore the possibility of conceiving a regional initiative for the sustainable management of hilsa fishery in the Bay of Bengal.

Episode of Change 2: The Hilsa Conservation Fund

The Darwin-Hilsa project work has been exploring the use of creating the 'right' incentives for a blue economy, and more specifically enhancing understanding on the use of economic incentives for sustainable fisheries management. During the period of this review, work has been carried out to develop a national conservation trust fund for the hilsa fishery in Bangladesh. Support from the Darwin-Initiative has been instrumental in allowing the SMG to define governance architecture and secure government buy in for establishing the trust fund.

Fearing that the fish stock would collapse in the near future due to fishery over exploitation, the Government of Bangladesh (GoB) declared five hilsa sanctuaries in the nursery grounds to protect young hilsa or jatka. Banning fishing deprives fishers of income—even if they will benefit from stock recovery in the long term—and with fishing communities among the most impoverished people in Bangladeshi society, these conservation efforts to limit catches have hit the poorer fishers the hardest. Compensation has been provided in the form of food aid (40 kilograms of rice per month for four months during the ban period), but it remains difficult for communities to comply with the regulations.

In developing countries, where fishing bans to allow spawning result in the loss of both food supply and income, the impacts on local fishers can be particularly severe. The IIED team has been encouraging the use of economic instruments that move beyond the existing punitive measures within marine and fisheries conservation and management, and which recommend the use of economic incentives to promote behavioural change. With developing country governments unable to fund incentive or compensation payments, the project team needed to look into innovative financing modalities to cover such payments. One solution is a legally

independent fisheries management trust fund, with seed capital kept in an endowment fund to enable it to replenish itself and provide on-going compensation.

2. How the change has occurred: how and what IIED AG funded activities have contributed

The project team has worked closely with the Bangladesh government to establish the Hilsa Conservation Trust Fund, ensuring that the model would work within existing government technical and institutional capacities and that its principles would be relevant to the target fishing communities.

A first task was to conduct a review of conservation trust funds (CTF) for sustainable marine resources management: Conditions for success. Covering 12 case studies from Africa, Asia, Latin America, the Caribbean, and Australasia, this Darwin Initiative funded report provided a broad overview of how to create a CTF; as well as the legal and institutional structure, fund generation and delivery models. Sharing these best practice insights into what makes trust funds sustainable and successful was crucial for getting support for the process in Bangladesh. The team's second task was then to draw up the documents for establishing how the Hilsa Conservation Trust Fund would work in practice in Bangladesh.

A 'task force' team of multi-disciplinary experts within Bangladesh prepared the business case document. Extensive consultations were held with key stakeholders, including local and international trust fund managers, fisher communities, civil society groups running trust funds, and senior officials from Bangladesh line ministries—the Department of Fisheries (DoF), the Planning Commission, Department of Finance etc. The fisher communities were instrumental in the design of the process: articulating the factors that influence their behaviour such as the power structures often hidden to external researchers. Financial inclusion was also brought into the trust fund planning to help liberate fishers from the trap of predatory lenders.

The background document and Memorandum of Article and Association were shared by different stakeholders in a national consultation workshop held in June 2015 for improvement/refinement and finalisation of the documents. In July 2015, both documents were revised and submitted to the Department of Fisheries and a series of steps are now underway towards approval by the government, registration by the appropriate authority, forming the board of trustees and establishing secretariat of the trust fund under the Director General (DG), DoF.

3. Evidence of change: stakeholders'/partners' feedback and available documentation

The widespread endorsement by senior officials in Bangladesh illustrates the extensive efforts made by the project team to ensure that the Hilsa Conservation Trust Fund has full political buy-in:

The support expressed by Prime Minister Sheikh Hasina for the initiative was carried in The News Today, the most popular English daily newspaper in Bangladesh in May 2015: "Hasina directed the officials to create a 'Hilsa Development Trust Fund' for its sustainable conservation and management, and said fry catchers who have cards would be given food support from the fund."

http://newstoday.com.bd/index.php?option=details&news_id=2407170&date=2015-04-02

At the June 2015 meeting in Dhaka where the business case for the fund was widely discussed, and its memorandum and articles, Bangladesh's Minister of Fisheries and Livestock, Muhammed Sayedul Hoque, confirmed his commitment to implementing the new fund: "I give you assurance that all possible measures will be taken by the Ministry of Fisheries and

Livestock for establishment of the Hilsa Conservation Trust Fund in Bangladesh for sustainable development, conservation and management of our national fish."

<http://www.iied.org/conservation-trust-fund-proposed-help-manage-bangladesh-fish-stocks-0>

Dr Syed Arif Azad, DG/DoF, also led a high-level Bangladeshi delegation to the European Development Days Forum, where researchers from IIED and Bangladesh Agricultural University presented a session on the lessons of the project for Bangladesh and other national governments. He promised: "We will take these recommendations seriously and I hope they will enable us to improve the effectiveness and efficiency of the incentive-based scheme for hilsa management. We will continue to work with IIED and other development partners to pursue the ratification process of the proposed Hilsa Conservation Trust Fund."

The widespread stakeholder consultation process for the Trust Fund has also led to its endorsement by other international donors. USAID have now developed a US\$15 million project that will build on the trust fund once it is ratified, and which includes (in principle) \$5 million to be used as the fund's seed capital. This in turn encouraged the GoB to commit match funding at 'at least' the same level.

4. What we have learnt from this episode of change

The process of establishing the Hilsa Conservation Trust Fund has identified two different sets of lessons. The first set, as defined through the 12-country case study report, relate to the general pre-conditions for establishing a trust fund (i.e. the need for diverse stakeholders with a common vision, funding for capable implementing organisations, the existence or rapid establishment of a basic legal and financial framework, and government buy-in); and the factors that are instrumental to trust fund success (i.e. a feasibility study, a diversified system of financing, strategic and financial planning, strategic partnerships, political support, financial expertise, and effective reporting and M&E).

A second set of lessons was learnt through the specific process in Bangladesh that relate to the regular structured engagements undertaken with key government actors to ensure political buy in. Whilst the majority of environment and development projects ensure that they consider the social and ecological factors, the political factors will often be missing. In Bangladesh, understanding the motivations of policy makers was found to be critical for determining the best means of communication and engagement on the trust fund.

5.1 Monitoring and evaluation

The project leader and host-country based partners have met twice in Years 1, 2, and 3 of the project period to monitor project progress. The project team members regularly reviewed the logical framework.

The cost of impact evaluation of the compensation scheme was overlooked during the project inception phase. However, (as mentioned in the previous section) the project team members have just secured additional funding from USAID through WorldFish to conduct a rigorous counterfactual impact evaluation of the scheme. This work is underway.

5.2 Actions taken in response to annual report reviews

[For those that have received feedback from annual reports, have you responded to all issues raised in the reviews of your annual reports? Please use this section as an opportunity to comment on any outstanding issues.](#)

[Have you discussed the reviews with your partners and other collaborators?](#)

6 Darwin identity

We have acknowledged Darwin Initiative funding and displayed the DI logo prominently in all our publications, workshop/meeting banners, and conference presentations.

We have also published several blog posts and press releases. Please see section 2.3. Publications and blogs/press releases were sent directly to a large number of practitioners, policy makers, and academics in both developed and developing countries. These were sent through IIED's new-publications newsletter, targeted emails to key stakeholders from Bangladesh, and the BioDiv-L mailing list managed by IISD.

The project was recognised as the Darwin-Hilsa project and has been hailed as the most successful project, particularly in highlighting the importance of sustainable hilsa fishery in Bangladesh.

All publications (including academic journals) have been made available for free download via IIED's website.

IIED's communications team has also used social media sites such as Twitter and Facebook to disseminate the knowledge products and articles.

Below are some of the extensive media coverage the project received owing to strategic media engagement through out the project period.

Some Media mentions (excluding media mentions in Bengali)

- 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>
- Five ways to boost stocks of hilsa fish <http://www.dhakatribune.com/bangladesh/2013/nov/28/five-ways-boost-stocks-hilsa-fish>
- 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/>
- 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-ii&catid=110:business-others&Itemid=156
- Five ways to boost stocks of the Bay of Bengal's beloved Hilsa fish <http://www.dhakacourier.com.bd/?p=14748>
- Regional cooperation can boost hilsa reserve in Bay: study <http://www.newagebd.com/detail.php?date=2013-11-28&nid=74668#.Upqcxye7TsQ>
- Regional cooperation can boost hilsa reserve in Bay: Study <http://unbconnect.com/hilsa-report/#&panel1-2>
- Country's 6th Ilish sanctuary coming soon <http://www.dhakatribune.com/bangladesh/2015/jan/20/country%E2%80%99s-6th-ilish-sanctuary-coming-soon>
- Drive against gillnet manufacturing soon <http://www.thedailystar.net/drive-against-gillnet-manufacturing-soon-60804>
- Efforts to boost hilsa production stressed <http://thedailynewnation.com/news/40169/efforts-to-boost-hilsa-production-stressed.html>
- Greater efforts to boost hilsa production suggested <http://www.thefinancialexpress-bd.com/2015/01/20/76756/print>

- Experts for greater efforts to boost hilsa output http://www.theindependentbd.com/index.php?option=com_content&view=article&id=244984:experts-for-greater-efforts-to-boost-hilsa-output&catid=161:region&Itemid=193
- Experts for greater efforts to boost hilsa output <http://unb.com.bd/hilsa-project>
- Conserving the hilsa: <http://www.ipsnews.net/2016/04/conserving-the-hilsa/>
- Call on Myanmar, Bangladesh and India to conserve the hilsa: <http://www.thedailystar.net/backpage/call-myanmar-bangladesh-india-conserve-hilsa-1218775>
- BBC Bangla http://www.bbc.com/bengali/multimedia/2016/05/160504_hilsa_cooperation
- Poverty endangers the hilsa in Bangladesh: <http://newsnetwork-bd.org/newsletter/2016/08/20/poverty-endangers-the-hilsa-in-bangladesh/>

7 Finance and administration

7.1 Project expenditure

Project spend (indicative) since last annual report	2015/16 Grant (£)	2015/16 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)			18%	BAU staff costs was reduced to cover the costs of national travel, operating costs (fieldwork) and laboratory capital items
Consultancy costs			26%	Consultancy costs was reduced to cover participation costs at EDD and production of short video
Overhead Costs			0%	
Travel and subsistence			-8%	
Operating Costs			-22%	Fieldwork costs came in higher than was budgeted; staff costs was reduced to fund the additional costs
Capital items (see below)			-100%	Essential laboratory equipment (multisensors, microtone blades, seechi disk) needed to carry out biological and physical assessments of hilsa fishery
Others (see below)			-280%	Cost of production of short video to communicate lessons learnt and episodes of change.
TOTAL				

Staff employed (Name and position)	Cost (£)
Essam Mohammed - Project Leader	
Coordinator - various staff members	
Ina Porras - Senior Researcher	
Liaquat Ali - Senior Fisheries Scientist	
Sarder Shafiqul Alam - Sociologist and survey design expert	
Prof Md. Abdul Wahab - Ecologist and limnologist	
Dr. Zoarder Faruque Ahmed - Ecologist	
Research Associate	
Research Assistant	
TOTAL	

Capital items – description	Capital items – cost (£)
Multisensor Plankton net / Seechi disc Microtone Blades <i>All capital items are held at Bangladesh Agricultural University (BAU), Mymensingh - 2202, Bangladesh</i>	
TOTAL	

Other items – description	Other items – cost (£)
Audit Costs [maximum contribution]	
Short Video Production	
TOTAL	

7.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
TOTAL	

7.3 Value for Money

The implementation of this project has delivered excellent value for money by building on IIED's deep understanding of the context and the players of Bangladesh. IIED has a long established partnership with the host country organisation, BCAS. This has enabled the project to operate within an already established partnership portfolio reaching and engaging all relevant sectors of government, civil society and target communities. Early engagements with key decision makers such as the Department of Fisheries has also helped us achieve government buy-in and meet project objectives effectively.

From the outset, staff cost was kept minimal (initially 48 per cent of total budget). Staff cost was further reduced to cover budget shortfall. BAU staff cost was reduced by 18 per cent to cover the cost of (originally) unbudgeted capital cost (£2,344), without which rigorous scientific analysis of the ecological and biological studies would not have been possible.

BCAS staff cost was reduced by 22 per cent to cover shortfall in fieldwork and other operating cost.

IIED team was able to generate more resources, primarily to cover staff time shortfall, and production of a short video that summarises lessons learned from the project.

Last but not least, the Darwin-Hilsa project has also inspired USAID to develop a \$15,000,000 EcoFish^{BD} project. The project is being implemented by WorldFish Bangladesh. IIED and BCAS are some of the partners helping with the research component of the project. The EcoFish project will help fill some of the knowledge gaps (e.g. counterfactual impact evaluation of the compensation scheme) and ensure successful implementation of the recommendations made by the Darwin project over the next five years.

Annex 1 Project's original (or most recently approved) logframe, including indicators, means of verification and assumptions.

Note: Insert your full logframe. If your logframe was changed since your Stage 2 application and was approved by a Change Request the newest approved version should be inserted here, otherwise insert the Stage 2 logframe.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Goal:</p> <p>Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.</p>			
<p>Outcome:</p> <p>By the end of the project, an improved mechanism for ensuring sustainable management of hilsa 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.</p>	<ol style="list-style-type: none"> 1- Increased number of “impacted” households and individuals involved in the payment scheme 2- Equitable benefit distribution system reflects the preference of the fisher communities 3- A sustainable national hilsa fish conservation fund to finance the scheme fits existing institutional and technical capacity 4- Exploitation rate (ER) of hilsa fishery in the lower Meghna reduced to optimal level (0.5) 5- The project outputs influence decision making process in Bangladesh and beyond. 	<p>Baseline and end of project assessment of socioeconomics of hilsa fishery</p> <p>Benefit distribution system report</p> <p>Benefit distribution system agreed by DoF and fisher communities</p> <p>National hilsa fish conservation trust fund – proposal document</p> <p>Ecological baseline and end of project assessment report</p> <p>Revision of the payment scheme based on the results of the research project</p> <p>Discussion on setting up similar schemes in Myanmar and India</p>	<ul style="list-style-type: none"> ▪ Overfishing is the main cause of depletion of hilsa fish stock ▪ The DoF continues to support the scheme during the project period and is not subject to political (in)stability
<p>Outputs</p> <ol style="list-style-type: none"> 1- Improved understanding of current ecological and socio economic characteristics of hilsa fishery 	<ol style="list-style-type: none"> 1a. Ecological baseline assessment 1b. Clear understanding of the costs of refraining from fishing during off season 1c. Clear understanding of the preference of the fisher communities for payment type and level 1d. Cost benefit analysis of conserving hilsa fish stocks 	<ol style="list-style-type: none"> 1a. Report on physical hydrological parameters of hilsa fishery by quarter 4 of Year 1 1b. Report on chemical and biological parameters of hilsa fishery including length-weight relationship by first quarter of Year 2 1c. Spawning and reproduction seasonality of hilsa fish by first quarter of 	

		<p>Year 2</p> <p>1d. report on the opportunity cost of participating in the payment scheme by quarter 4 of Year 1</p> <p>1e. report on the cost of running the scheme (administrative/transaction costs) by quarter 4 of year 1</p> <p>1f. A report on the preference of the public for payment types and levels by quarter 1 of year 2</p> <p>1g. A paper on cost and benefit of the payment scheme and long term economic feasibility by quarter 2 of year 2</p>	
2- Improved understanding of institutional capacity needs, opportunities and gaps to ensure the effective management and functioning of the repayment scheme	<p>2a. Existing legal and policy frameworks assessed</p> <p>2b. Technical and institutional capacity needs identified</p> <p>2c. Capacity-strengthening action plan and strategy</p>	<p>2a. A report on legal and policy frameworks assessment relevant to hilsa fishery and the implementation of the payment mechanism by quarter 4 of year 1</p> <p>2b. Technical and institutional capacity needs assessment report by quarter 4 of year 1</p> <p>2c. Capacity-strengthening action plan drafted by quarter 1 of Year 2</p> <p>2d. Capacity strengthening strategy developed by quarter 2 of Year 2</p>	
3- Enhanced engagement between the Department of Fisheries and fisher communities in the lower Meghna	<p>3a. Based on output 1 and 2 above, 'equitable' benefit distribution system is formulated</p> <p>3b. Terms of benefit distribution system are agreed by both the implementing governmental agency (DoF) and the impacted communities</p>	<p>3a. Equitable benefit distribution system document and community stakeholder consultation report by quarter 3 of year 2</p> <p>3b. Community and stakeholder consultation report</p> <p>3c. Memorandum of understanding is signed between DoF and fisher communities by quarter 4 of year 2</p>	
4- Sustainable national hilsa conservation fund proposed and	4a. The principles of setting up hilsa conservation fund in Bangladesh are defined	4a. A preliminary report on the principles of hilsa conservation fund by quarter 2 of year 2	

<p>agreed by DoF</p>	<p>4b. Hilsa conservation fund proposal 4c. Consultation workshop with DoF, Ministry of Finance, Civil Society and the Private Sector is held 4d. The proposal is amended and agreed</p>	<p>4b. hilsa conservation fund proposal produced in the second quarter of year 2 4c. Consultation workshop held in 3rd quarter of year 2 4d. Hilsa conservation fund is agreed and ratified in the 2nd quarter of year 3</p>	
<p>5- Project outputs are disseminated to influence decision making in Bangladesh and beyond</p>	<p>5a. Number of workshops, research outputs, news articles and press releases 5b. Regional workshop involving policy makers from Myanmar and India</p>	<p>5a. 3 national workshops held (one workshop in years 1, 2 and 3) 5b. 2 Presentation in international conferences (in year 2 and 3) 5c. 5 research paper published in academic journals (in year 2 and 3) 5d. 3 press releases (during inception workshop, national/regional workshop, and ratification of the hilsa conservation fund) 5e. 12 articles in prominent national and regional newspapers (during the project period) 5f. Workshop report 5g. Participation of delegates from Myanmar and India.</p>	
<p>Activities</p> <p>Activity 1.1 Inception workshop Activity 1.2 Physical and hydrological assessment of hilsa fishery Activity 1.3 Chemical and biological assessment of hilsa fishery Activity 1.4 Assessment of spawning and reproductive seasonality of hilsa 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)</p> <p>Activity 2.1 Existing legal and policy framework analysis Activity 2.2 Technical and institutional capacity needs assessment</p>			

Activity 2.3	Capacity-strengthening action plan
Activity 2.4	Developing capacity strengthening strategy
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
Activity 4.1	Study on the principles of hilsa Conservation Fund
Activity 4.2	First draft of hilsa Conservation Fund document
Activity 4.3	Consultation workshop to refine the hilsa Conservation Fund document
Activity 4.4	Ratification of hilsa Conservation Fund
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 2 Report of progress and achievements against final project logframe for the life of the project

Note: For projects that commenced after 2012 the terminology used for the logframe was changed to reflect DFID's terminology.

Project summary	Measurable Indicators	Progress and Achievements	Comments
<p>Goal: Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.</p>			
<p>Outcome: By the end of the project, an improved mechanism for ensuring sustainable management of hilsa 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.</p>	<ul style="list-style-type: none"> • Increased number of “impacted” households and individuals involved in the payment scheme • Equitable benefit distribution system reflects the preference of the fisher communities • A sustainable national hilsa fish conservation fund to finance the scheme fits existing institutional and technical capacity • Exploitation rate (ER) of hilsa fishery in the lower Meghna reduced to optimal level (0.5) • The project outputs influence decision making process in Bangladesh and beyond. 	<ul style="list-style-type: none"> • 224,000 households by the end of the project period. This is equivalent to an increase by almost 20% • Principles of equitable benefit sharing mechanism was developed. The document which was mutually agreed by DoF and representatives of the fisher communities clearly mentions the need to assess preferences of recipient communities before compensation packages are determined. • A business plan and Memorandum and Articles of Association of a National Hilsa Conservation Fund have been developed and duly submitted to the Ministry of Fisheries and Livestock. • By the end of the project period, hilsa catch has increased by 11%. Catch per unit effort (CPUE) has also increase from 3 – 8 kg to 5 – 8 kg per hour per 100 metres long and four metres wide net. This is a significant recovery of the fish stock. • Through this project, we were able to introduce amendments to two policies, namely: (1) the Protection and Conservation of Fish Act. 1950 	

		(Act No. XVIII of 1950) and, (2) the Marine Fisheries Ordinance, 1983 (Ordinance No. XXXV of 1983). Please see Section 5.	
Output 1 Improved understanding of current ecological and socio economic characteristics of hilsa fishery	<p>1a. Ecological baseline assessment</p> <p>1b. Clear understanding of the costs of refraining from fishing during off season</p> <p>1c. Clear understanding of the preference of the fisher communities for payment type and level</p> <p>1d. Cost benefit analysis of conserving hilsa fish stocks</p>	<ul style="list-style-type: none"> • State of the art biophysical and chemical assessments of hilsa fishery was done. This was first of a kind to be conducted in Bangladesh in at least 3 decades. • A comprehensive study that assess the cost of compensation including administrative and transaction cost was completed. • A study to assess preferences for compensation package using choice experiment was conducted and effectively communicated with stakeholders. 	
Activity 1.1 Inception workshop		(Completed) Inception workshop was held in	
Activity 1.2 Physical and hydrological assessment of hilsa fishery		(Completed) a comprehensive report on biological, chemical and physical assessments of hilsa fishery habitats produced.	
Activity 1.3 Chemical and biological assessment of hilsa fishery		(completed) same as above.	
Activity 1.4 Assessment of spawning and reproductive seasonality of hilsa		(completed) same as above	
Activity 1.5 Assessment of the opportunity cost of participating in the payment scheme		(Completed) economic cost of the incentive-based hilsa fishery management was done. Please see output progress above.	

Activity 1.6 Estimation of the transaction and administrative cost the scheme		(completed) same as above.	
Activity 1.7 Assessment of the preference of the public for payment formats (level and type)		(completed) same as above.	
Output 2 Improved understanding of institutional capacity needs, opportunities and gaps to ensure the effective management and functioning of the repayment scheme	2a. Existing legal and policy frameworks assessed 2b. Technical and institutional capacity needs identified 2c. Capacity-strengthening action plan and strategy	<ul style="list-style-type: none"> Legal and institutional frameworks were reviewed; gaps identified and some concrete policy recommendations were made. Based on the above study, capacity building action plan and strategy was developed and submitted to DoF. 	
Activity 2.1 Existing legal and policy framework analysis		(completed) an assessment of legal and institutional frameworks was done.	
Activity 2.2 Technical and institutional capacity needs assessment		(completed) a gap analysis of technical and institutional capacities was done.	
Activity 2.3 Capacity-strengthening action plan		(completed) Capacity strengthening strategy and action plan prepared and submitted to the DoF.	
Activity 2.4 Developing capacity strengthening strategy		(completed) Same as above.	
Output 3 Enhanced engagement between the Department of Fisheries and fisher communities in the lower Meghna	3a. Based on output 1 and 2 above, 'equitable' benefit distribution system is formulated 3b. Terms of benefit distribution system are agreed by both the implementing governmental agency (DoF) and the impacted communities	<ul style="list-style-type: none"> Information gathered from outputs 1 and 2 were used to develop principles of benefit sharing system. A rigorous analysis on targeting has been completed. In addition, a medium-scale survey with 230 households has been conducted to assess 'who gets what and why?' We were advised to conduct the additional survey by the senior officials from DoF following the multistakeholder workshop on 	

		equitable benefit sharing that was held in the DoF Conference Room in <i>Matshya Bhaban</i> , Dhaka on the 19th of January 2015. The workshop was attended by 60 participants including senior government officials, District Fisheries Officers, academics and representatives of the fisher communities. A final document on principles of benefit sharing system was developed and mutually agreed by DoF and representatives of hilsa fisher communities.	
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			
Output 4 Sustainable national hilsa conservation fund proposed and agreed by DoF	<p>4a. The principles of setting up hilsa conservation fund in Bangladesh are defined</p> <p>4b. Hilsa conservation fund proposal</p> <p>4c. Consultation workshop with DoF, Ministry of Finance, Civil Society and the Private Sector is held</p> <p>4d. The proposal is amended and agreed</p>	<ul style="list-style-type: none"> • By the end of the project period, a background document that makes a business case for the establishment of hilsa conservation fund was prepared • In addition to the background document, a Memorandum and Articles of Association of the conservation fund was prepared, revised, and submitted to the DoF. • Consultation workshop with DoF and other relevant stakeholders was conducted on 11 June 2015. • The documents were further revised and re-submitted to the Ministry of Fisheries and Livestock. Background document and MAoA are provided along with this report. 	

		(Please see Hilsa Knowledge Basket)	
Activity 4.1 Study on the principles of hilsa Conservation Fund		(completed) 12 conservation funds from across the globe were reviewed.	
Activity 4.2 First draft of hilsa Conservation Fund document		(completed) a national taskforce team on hilsa conservation fund produced two documents, namely: (1) background document (business case), and (2) memorandum and articles of association of the trust fund.	
Activity 4.3 Consultation workshop to refine the hilsa Conservation Fund document		(completed) a national seminar on hilsa conservation fund was held.	
Activity 4.4 Ratification of hilsa Conservation Fund		(completed) revised documents on the memorandum and articles of association of the hilsa conservation fund submitted to DoF. Ratification process ongoing.	
Output 5 Project outputs are disseminated to influence decision making in Bangladesh and beyond	5a. Number of workshops, research outputs, news articles and press releases 5b. Regional workshop involving policy makers from Myanmar and India	Extensive knowledge products were produced and widely disseminated. In addition, the following workshops and international events were held: <ul style="list-style-type: none"> • Inception workshop • National workshop on benefit sharing mechanism • National workshop on hilsa conservation fund • Regional Seminar that brought delegates from Myanmar, India and Bangladesh was held 4-5 May 2016 to discuss transboundary hilsa fishery management 	The project has also received extensive media coverage. Please see section 2 of this report.
Activity 5.1 National/regional workshop		The following national and regional workshops were held: <ul style="list-style-type: none"> • Inception workshop • National workshop on benefit sharing mechanism • National workshop on hilsa conservation fund • Regional Seminar that brought delegates from Myanmar, India and Bangladesh 	
Activity 5.2 Presentation of research products in major international conferences		Members of the project team attended at the following international conferences: International Conferences: International Conference on Policy Mixes in Environmental and Conservation	

	<p>Policies 25 - 27 February 2014 in Leipziger KUBUS, Leipzig, Germany</p> <p>EnvEcon 2014: Applied Environmental Economics Conference 14th March, The Royal Society, London</p> <p>IIED conference on Innovations for equity in smallholder PES: bridging research and practice 21 March in Edinburgh, UK</p> <p>The 16th Annual BIOECON Conference on Biodiversity, Ecosystem Services and Sustainability, 21-23 September 2014, Kings College, Cambridge, United Kingdom.</p> <p>Seminar at the FAO HQ, Rome on the 19th of September 2014. (Incentive-based hilsa fish management in Bangladesh)</p> <p>Rethinking Capitals: Going beyond the financial 17 December 2014</p> <p>Bangladesh Agricultural University Research System (BAURES), 25-26 January 2015, Mymensingh, Bangladesh</p> <p>European Development Days, 2 – 4 June 2015, Brussels, Belgium</p> <p>Indian Ocean Summit, 1 – 5 December, 2015, Goa, India.</p> <p>International Institute of Fisheries Economics and Trade (IIFET) Conference, 11 -15 July 2016, Aberdeen, Scotland</p>
<p>Activity 5.3 Submission of research products to academic journals</p>	<p>Two research outputs published in academic journals:</p> <p>Bladon, A., Short, K., Mohammed, E.Y., and Milner-Gulland, E.J. 2014. Payments for ecosystem services in developing world fisheries. <i>Fish and Fisheries</i>. DOI: 10.1111/faf.12095</p> <p>Islam, M., Mohammed, E.Y., and Liaquat, A. 2016. Economic incentives for sustainable hilsa fishing in Bangladesh: An analysis of the legal and institutional framework. <i>Marine Policy</i>, vol. 68, pp. 8–22</p> <p>In addition three manuscripts have been submitted to academic journal. They are under review.</p>
<p>Activity 5.4 Press releases</p>	<p>Four press releases were produced for the following events:</p> <p>Inception workshop</p> <p>National workshop on equitable benefit sharing</p> <p>National workshop on hilsa conservation fund</p> <p>Regional seminar on incentive-based hilsa management in the Bay of Bengal.</p>

Annex 3 Standard Measures

Code	Description	Total	Nationality	Gender	Title or Focus	Language	Comments
Training Measures							
1a	Number of people to submit PhD thesis	1	Bangladesh	M	Biology and ecology of hilsa fishery	English	Mr Kaisir Hassan has submitted his PhD dissertation and is currently awaiting his viva. He was co-supervised by the project leader.
1b	Number of PhD qualifications obtained	1	UK	F	PES for developing world fishery	English	Annabelle Bladon completed her PhD under Prof. E.J's supervision. The Project leader co-supervised her.
2	Number of Masters qualifications obtained						
3	Number of other qualifications obtaine						
4a	Number of undergraduate students receiving training						
4b	Number of training weeks provided to undergraduate students						
4c	Number of postgraduate students receiving training (not						

Code	Description	Total	Nationality	Gender	Title or Focus	Language	Comments
	1-3 above)						
4d	Number of training weeks for postgraduate students						
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(e.g., not categories 1-4 above)						
6a	Number of people receiving other forms of short-term education/training (e.g., not categories 1-5 above)						
6b	Number of training weeks not leading to formal qualification	12	Bangladesh	9M 3F	Choice experiment method and eliminating bias.	English	12 enumerators from BCAS were given a 3 day training on the use of choice experiment method, and sources of biases.
7	Number of types of training materials produced for use by host country(s) (describe training materials)						

Research Measures	Total	Nationality	Gender	Title	Language	Comments/ Weblink if available
9 Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (ies)						Participatory process?

10	Number of formal documents produced to assist work related to species identification, classification and recording.						
11 a	Number of papers published or accepted for publication in peer reviewed journals	2	UK/Bangladesh/Eritrea	3F, 3M			<p>1- http://www.sciencedirect.com/science/article/pii/S0308597X1600049X</p> <p>2- http://onlinelibrary.wiley.com/doi/10.1111/faf.12095/abstract</p>
11 b	Number of papers published or accepted for publication elsewhere	13	Bangladesh/Eritrea/UK	3F, 7M			<p>Balancing carrots and sticks: incentives for sustainable hilsa fishery management in Bangladesh http://pubs.iied.org/16619IIE.html</p> <p>Payments for coastal and marine ecosystem services: prospects and principles http://pubs.iied.org/17132IIE.html?c=fish</p> <p>Payments for ecosystem services in developing world fisheries http://onlinelibrary.wiley.com/doi/10.1111/faf.12095/pdf</p> <p>Economic incentives for sustainable hilsa fishing in Bangladesh: An analysis</p>

							<p>of the legal and institutional framework http://www.sciencedirect.com/science/article/pii/S0308597X1600049X</p> <p>Direct economic incentives for sustainable fisheries management: the case of Hilsa conservation in Bangladesh http://pubs.iied.org/16527IIED.html?c=fish</p> <p>Economic incentives for sustainable hilsa fish management in Bangladesh: An analysis of the legal and institutional framework http://pubs.iied.org/15523IIED.html?c=fish</p> <p>The cost of compensation: Transaction and administration costs of hilsa fish management in Bangladesh http://pubs.iied.org/15522IIED.html?c=fish</p> <p>A Review of Conservation Trust Funds for Sustainable Marine Resources Management: Conditions for Success http://pubs.iied.org/16574IIED.html?c=fish</p>
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							<p>Incentive-based Hilsa fish conservation and management in Bangladesh: prospects and challenges http://pubs.iied.org/G03688.html?c=econ</p> <p>Mitigating unintended local economic impacts of the compensation scheme for hilsa management http://pubs.iied.org/pdfs/17282IIED.pdf</p> <p>Food and feeding ecology of hilsa (Tenulosa ilisha) in Bangladesh's Meghna River basin http://pubs.iied.org/16609IIED.html?c=fish</p> <p>Protecting ecosystems and livelihoods http://pubs.iied.org/17199IIED.html?c=fish</p> <p>The biophysical assessments of the hilsa fish (Tenulosa ilisha) habitat in the lower Meghna, Bangladesh http://pubs.iied.org/16605IIED.html?c=fish</p>
12 a	Number of computer-based databases established (containing species/generic information) and handed over						

	to host country						
12 b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country						
13 a	Number of species reference collections established and handed over to host country(s)						
13 b	Number of species reference collections enhanced and handed over to host country(s)						

Dissemination Measures		Total	Nationality	Gender	Theme	Language	Comments
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	3 national workshops 1 regional seminar				English	
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	10 (international conferences)				English	Please see Annex 2

Physical Measures		Total	Comments
20	Estimated value (£s) of physical assets handed over to host country(s)	£2,344	Multisensor Plankton net / Seechi disc Microtone Blades All capital items are held at Bangladesh Agricultural University (BAU),

			Mymensingh - 2202, Bangladesh
21	Number of permanent educational, training, research facilities or organisation established		
22	Number of permanent field plots established		

Financial Measures		Total	Nationality	Gender	Theme	Language	Comments
23	Value of additional resources raised from other sources (e.g., in addition to Darwin funding) for project work						

Annex 4 Aichi Targets

	Aichi Target	Tick if applicable to your project
1	People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	X
2	Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	
3	Incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	X
4	Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	X
5	The rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	
6	All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	X
7	Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	
8	Pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	
9	Invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	
10	The multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	
11	At least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	X
12	The extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	X
13	The genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	

14	Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	X
15	Ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	
16	The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	
17	Each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	
18	The traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	X
19	Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	
20	The mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	X

Annex 5 Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. web link, contact address etc)
Working paper	Mohammed, E. Y. and Wahab. A. (2013). Direct economic incentives for sustainable fisheries management: the case of Hilsa conservation in Bangladesh. International Institute for Environment and Development, London	Eritrea	UK	M	IIED, London	http://pubs.iied.org/pdfs/16527IIED.pdf
Synthesis report	Dewhurst-Richman N, Mohammed EY, Ali ML, Hassan K, Wahab MA, Ahmed ZF, Islam MM, Bladon A, Haldar GC, Ahmed CS, Majumder MK, Hossain MM, Rahman A and Hussein B (2016) Balancing carrots and sticks: incentives for sustainable hilsa fishery	UK	UK/Bangladesh	F	IIED, London	http://pubs.iied.org/16619IIED/

	management in Bangladesh. IIED, London.					
Briefing paper	Mohammed, E. Y. 2013. Payments for coastal and marine ecosystem services: prospects and principles	Eritrea	UK	M	IIED	http://pubs.iied.org/17132IIED/?c=fish
Academic journal	Bladon, A., Short, K., Mohammed, E. Y., and Milner-Gulland, E. J. 2014. Payments for ecosystem services in developing world fisheries. <i>Fish and Fisheries</i> . DOI: 10.1111/faf.12095	UK	UK	F	Fish and Fisheries	http://onlinelibrary.wiley.com/doi/10.1111/faf.12095/pdf
Academic journal	Islam, M., Mohammed, E. Y., and Liaquat, A. 2016. Economic incentives for sustainable hilsa fishing in Bangladesh: An analysis of the legal and institutional framework. <i>Marine Policy</i> , vol. 68, pp. 8–22	Bangladesh		M	Marine Policy	
Working paper	Haldar, G. C, Alia, L. 2014. Transaction and	Bangladesh	Bangladesh	M	IIED, London	http://pubs.iied.org/15522IIED/?c=fish

	Administrative Cost for Hilsa Conservation and Management in Bangladesh. IIED Working Paper. IIED, London.					
Working paper	Bladon, A., Mohammed, E., Milner-Gulland, E.J. 2014. A Review of Conservation Trust Funds for Sustainable Marine Resources Management: Conditions for Success. IIED, London.	UK	UK	F	IIED, London	http://pubs.iied.org/16574IIED/?c=fish
Workshop report	Mohammed, E. Y. (ed) (2013). Incentive-based Hilsa fish conservation and management in Bangladesh: prospects and challenges, Workshop report, March 24-25, IIED, London.	Eritrea	UK	M	IIED, London	http://pubs.iied.org/G03688/?c=econ
Briefing paper	Mohammed, E. Y., Chowdhury, S. A., and Ali, L. 2015. Mitigating unintended local economic impacts	Eritrea	UK	M	IIED, London	http://pubs.iied.org/pdfs/17282IIED.pdf

	of the compensation scheme for hilsa management. IIED briefing papers. IIED, London					
Working paper	Hasan, K.M.M., Ahmed,Z.F., Wahab, A., Mohammed, E.Y., 2015. Food and feeding ecology of hilsa (<i>Tenualosa ilisha</i>) in Bangladesh's Meghna River basin. IIED Working Paper. IIED, London.	Bangladesh	Bangladesh	M	IIED, London	http://pubs.iied.org/16609IIED/?c=fish
Reflect and Act	Mohammed, E.Y. 2014. Protecting livelihoods and ecosystems	Eritrea	UK	M	IIED, London	http://pubs.iied.org/17199IIED/?c=fish
Working paper	Hasan, K.M.M., Wahab, A., Ahmed, Z.F., Mohammed, E.Y., The biophysical assessments of the hilsa fish (<i>Tenualosa ilisha</i>) habitat in the lower Meghna, Bangladesh. IIED Working Paper. IIED, London.	Bangladesh	Bangladesh	M	IIED, London	http://pubs.iied.org/16605IIED/?c=fish

Annex 6 Darwin Contacts

Ref No	20-015
Project Title	Economic incentives to conserve hilsa fish (<i>Tenualosa Ilisha</i>) in Bangladesh
Project Leader Details	
Name	Essam Yassin Mohammed
Role within Darwin Project	Project leader
Address	80-86 Gray's Inn Road, WC1X 8NH London, UK
Phone	
Fax/Skype	
Email	
Partner 1:	
Name	Liaquat Ali
Organisation	Bangladesh Centre for Advanced Studies
Role within Darwin Project	Main host-country project partner and coordinator of socioeconomic studies
Address	Rd No 16/A, Dhaka, Bangladesh (Phone: +880 2-8818124)
Fax/Skype	
Email	
Partner 2	
Name	Zoarder Farouq Ahmed
Organisation	Bangladesh Agricultural University (BAU)
Role within Darwin Project	Coordinator of biophysical study of the project
Address	Bangladesh Agricultural University (BAU), Mymensingh - 2202, Bangladesh
Fax/Skype	
Email	