



## Darwin Initiative: Final Report Review

### Darwin Project Information

Project reference	21-013
Project title	Alternative Livelihood Opportunities for Marine Protected Areas Fisherwomen
Host country(ies)	Sierra Leone
Lead organisation	University of Stirling
Partner institution(s)	Institute of Marine Biology and Oceanography (IMBO), Fourah Bay College, University of Sierra Leone; Njala University, Sierra Leone
Darwin grant value	£247,264
Start/end dates of project	01 April 2014 – 31 October 2018
Project leader name	Dr Francis Murray
Project website/blog/Twitter	<a href="https://www.stir.ac.uk/darwinoysterproject">https://www.stir.ac.uk/darwinoysterproject</a>
Review date	October 2019

### 1. Project Summary

This University of Stirling led project worked with selected communities around the Sherbro River Estuary in Southern Province, Sierra Leone to explore alternative sustainable income earning opportunities for local women in mangrove oyster cultivation and sales.

Mangrove forests along the coastline and estuaries are being degraded by over-harvesting of aquatic animals, including shellfish, as well as the associated degradation of mangrove trees. Mangrove trees are being damaged by the unsustainable harvest of oysters or cut down and used for firewood, with the land then converted for rice cultivation, shrimp ponds or saltponds.

The original premise of this project was that oyster harvesting was unsustainable and therefore the project sought to provide alternative livelihood options for the women that harvest these species seasonally. Upon further investigation, it became clear that oyster numbers were robust and not under any great strain despite increasing harvesting effort. Therefore, the project turned its attentions to focusing on achieving greater value post-harvest for these rural communities. Due to the combination of rapid population growth, lack of alternative livelihoods and weak regulation of the open-access oyster fishery, the project had a specific focus on market incentives to support improved environmental outcomes.

### 2. Project Outputs

The project's logframe has changed significantly since the original Stage 2 application. As the final report acknowledges, a range of challenges including the Ebola outbreak in December 2013 led to significant delays in implementation. In addition, the failure of key assumptions to hold true, particularly those around rates of oyster depletion and the viability of cold-chain interventions, have all contributed to these changes. The project has adapted its aims well to these challenges and has made full use of the change request process. This section of the review examines project achievements in relation to the latest approved logframe agreed with Darwin through a formal change request agreed in May 2017.

*Output 1 Secondary pressure on mangrove populations reduced through more fuel efficient processing*

In relation to indicator 1.1, the project team researched and evaluated the fuel efficiency gains of steaming troughs (primary processing) which were found to require an average of 43% less fuel per unit output than conventional troughs. This is slightly below the indicator target of 50%. Photographic evidence of this research is provided in the body of the report with additional evidence provided in various annexes. Section 3.1 of the report does not discuss fuel efficiency increases in secondary processing.

In relation to mangrove clearance rates, available remote sensing data was insufficient to allow reliable quantification, a common challenge when using Earth Observation data. Instead, primary survey data was used with the survey administered by 52 female harvesters across 9 focal communities. This is an acceptable alternative to satellite data, however there may still have been more robust methods to estimate mangrove cover change (e.g. radar data, Google Earth very high resolution data, or data from the [Global Mangroves Watch](#)). Analysis of the survey data indicates potentially significant fuel reductions across target communities. However, it is important to note that the figures quoted in the report are of potential reductions in fuel consumption, rather than those achieved through the lifetime of the project.

*Output 2 Profitability of female oyster gathering increased through testing and adoption of extended product 'shelf-life' and value added processing techniques*

Retail trials were implemented by women from 3 Sherbro Island communities, with packaged snacks sold in Moriba town and from strategic roadside locations. The report notes that roadside vending circumvents entry barriers to more formal retail markets, but the potential negative impacts of this (e.g. personal safety risks) are not considered.

The cost-benefit analysis indicates a net margin of 108% for the value added snacks, far exceeding the logframe target of 7%. This clearly offers a potentially valuable means of increasing vendor incomes. However, whilst the research conducted by the project has identified this as a potentially lucrative livelihood option, it is not clear the number of women capable of selling steamed oysters in the Bonthe market has increased by 10% (indicator 2.b) nor that that there has been a concomitant decrease in fuel use for secondary processing (indicator 2.c).

What the project has done, is to establish the viability of a light smoking technique that may, in the future, provide the basis for such gains. It has also established the potential for achieving significant increases in margin through further product processing (serving with sauces etc.). Quotations included in the text demonstrate the customer satisfaction and potential market for these products. Useful photographs are included as evidence of the value added products themselves.

*Output 3: Safety and seasonality of female oyster gathering opportunities increased through localised re-use of shell waste for low-input-output culture enhancements on mud banks*

The final project report documents project and MSc research into the potential of shell waste for reef enhancement. However progress against the relevant logframe indicators (3a-c) is not clearly articulated.

#### *Output 4: Demand for value-added products created through branding and promotion*

The Bonthe Oyster logo was created alongside material for the Bonthe Oyster Festival in 2017, incorporating relevant local images as well as the Darwin logo. Photographs of packaging are included as evidence in the report. Radio shows and adverts have been effectively used to raise awareness of the project and the Oyster festival. Prohibitive barriers to entry were identified preventing branded packaged oysters in formal retail outlets (indicator 4b) however the success of the roadside vending trial demonstrates the growing demand for and awareness of Bonthe Oyster products.

#### *Output 5: Sherbro women's oyster gatherer's association established based on mutually beneficial cooperation around processing and marketing interventions*

Three women's oyster gatherer's associations were established representing a total of 61 active gatherers across three focal communities. Members including leaders of these three groups were provided training and marketing materials prior to the value-added product placement trials (images included in report).

#### *Output 6: Research outputs documented and shared with target audiences*

The project team presented key policy recommendations to relevant stakeholders at the second oyster festival. It would be interesting to know whether there was any commitment from the policy makers in attendance to take forward these recommendations, or any other interaction with them (for example the policy brief referred to in indicator 6c). Two scientific papers are in preparation for journal submission, and presentations were made at two international conferences (6a and b).

### **3. Project Outcome**

As with the project Outputs, the intended project Outcome has changed significantly since application stage. The original Outcome was, 'Incomes of oyster-fisherwomen in at least 40 households of the Sherbro MPA increased by 45% pa and abundance/ mean-size of adjacent wild-oyster populations increased by at-least 18% over base-line levels.'

As part of the restructuring of the project logframe the Outcome was revised in discussion with Darwin to, 'Environmentally sustainable mangrove-oyster harvesting and value-added processing and marketing options for female gatherers evaluated and rolled out in the Sherbro Marine Protected Area (Bonthe District, Sierra Leone). Prudent harvesting and fuel-efficient processing also reduces pressure on mangrove populations with associated biodiversity gains.'

It is worth noting that this represents a significant reduction in ambition. It is understood that this is in part due to the challenges faced around the Ebola crisis and the failure of key assumptions to hold true. However, at application stage, the question of value for money was raised by the Darwin Expert Committee as part of the project award process, and the project confirmed by letter in March 2014 that, with average household sizes mostly of more than 20 people, the actual number of project beneficiaries would be up to 1,000 people. Concerns about the value for money of the project resurfaced in AR4R, where the reviewer emphasised the need for more information on project beneficiary selection and engagement, given the reduction in number of intended direct beneficiaries to 30.

The revised project logframe has 2 outcome level indicators: income from oyster processing and marketing activity of at least 30 female gatherers in 8 communities increased by at least 10% by end of project; rate of mangrove degradation (and associated botanical and invertebrate diversity) relative to overall oyster gathering livelihood dependency, reduced by at least 8% across 8 study sites as a result of improved oyster (and potentially fish) harvesting, processing and collective marketing practices by end of project .

The valuable research and piloting work carried out by this project has created a solid evidence base upon which community interventions can usefully build to achieve these targets. The high potential net profit, for example, demonstrated through the pilot marketing trials promises a particularly fruitful avenue for future work. However, in terms of attainment of the project's intended Outcome which includes a clear emphasis on not just the evaluation of processing and marketing options, but their roll out, the project has fallen short. Similarly, whilst fuel efficient processing methods have been examined and trialled, wider uptake of the upscaled steaming troughs has not yet occurred and reduced pressure on mangrove populations has therefore not yet been achieved.

It is understood that the project has faced substantial challenges, particularly in relation to the Ebola outbreak, which have resulted in substantial implementation delays. It is hoped that the important research conducted by this project will be taken forward and rolled out for example through financial support from the Whitstable Oyster Company.

**Grade: C**

Score	Outcome description
A++	Outcome substantially exceeded
A+	Outcome moderately exceeded
A	Outcome met expectation
B	Outcome moderately did not meet expectation
C	Outcome substantially did not meet expectation

#### **4. Project achievements and Impact**

The intended impact of this project was, 'Improved well-being of local communities and reduced pressure on mangrove populations resulting from improved sustainability of mangrove-oyster harvesting and processing practices and value added marketing in the Sherbro Marine Protected Area (Bonthe District, Sierra Leone).' As discussed in relation to the project Outcome above, the research and pilot interventions carried out through this Darwin project have contributed to our understanding of how this impact may be achieved. However, there is not yet significant evidence to suggest that this project has made a significant contribution to this impact in practice.

#### **5. Contribution to Darwin Initiative Programme Objectives**

The final report provides evidence that the project has contributed to SDG 1 (through the development and piloting of a value-added marketing model), SDG 5 (importantly, the project has an explicit focus on engaging and working with female led community institutions), SDG 8 (through the piloting of the value-added marketing approach), and SDG 13 (through the potential benefits of increasing the fuel efficiency of processing activities, identified thorough this research). Whist the project has not resulted in significant direct impacts on biodiversity in the project area, biodiversity benefits will accrue if project research findings and pilot studies are taken forward post Darwin funding.

## **6. Project support to poverty alleviation**

As discussed above, the project research and pilot activities will have potentially significant indirect poverty benefits, if the work of the project is taken forward post Darwin funding. The project has also had a direct impact on poverty. As detailed in the Outputs section of this review, 3 women's oyster gatherer's associations were established representing a total of 61 active gatherers across three focal communities, benefitting from materials and training, and participating in the pilot value added activities.

## **7. Project support to gender equality issues**

The clear consideration of gender issues and focus of interventions on livelihood activities traditionally associated with women, and the engagement of women led community institutions, is a real strength of this project. Effectively engaging with gender issues in conservation and livelihoods interventions is frequently a challenge for Darwin projects. Although not discussed in detail in Section 4.4 of the annual report, this project has clearly demonstrated their contribution to gender equality.

## **8. Transfer of knowledge**

Four MSc students (2 male, 2 female) engaged in this project, undertaking extended fieldwork on topics related to the project, contributing to the successful award of their degrees. One of these students was from Sierra Leone, the others from Stirling University.

In addition to the draft academic publications referred to above, the project has used international media outlets to raise awareness of the knowledge generated through the project. Coverage has included articles in trade press, The Sunday Times colour supplement and most recently (July 2019) coverage of the first post-project Bonthe Oyster Festival on BBC world Africa Focus, BBC SE UK, the Kent Messenger UK and trade journals 'The Grower' and 'Fish Farmer' (evidence provided in Annex 7 of the Final Report).

## **9. What is the sustainability and legacy of the project? What achievements are likely to endure and why?**

The long-term sustainability of this project is based on the strengthening of local institutions and the identification and empowerment of capable, trusted, and accountable institutional leaders. This will be key to the project's longer term success and sustainability, but additional funding will also be required to take forward the successful pilot interventions undertaken through this project.

The final report notes that the Sherbro women's oyster marketing association has opened a SWOMA group bank-account through which the Whitstable Oyster Company will provide post-project funding for an additional 5 years with a view to helping SWOMA become economically sustainable. This funding will also secure the immediate future of the Oyster Festival. The reviewer strongly urges the project team to investigate other potential sources of funding, as securing additional resources would enable the key pilot interventions identified through this project to be rolled out within the target communities and beyond.

The report identifies the sale of carbon credits through improved mangrove stewardship as one potential means of cementing the sustainability of this project. This may be a potentially fruitful avenue to explore, however the challenges associated with such an approach should not be underestimated. Numerous Darwin funded projects have looked to explore the potential of Carbon credits to fund conservation efforts, but few have been successful.

## **10. What lessons learned/failures/challenges from this project could be used to improve/inform future Darwin projects or the wider Darwin programme and community?**

The final report identifies a number of lessons relating to the technical side of project implementation in challenging contexts including:

- The absence of a workable cold-chain solution imposes similar conservation challenges for fishermen in remote satellite communities.
- The potential benefits of recruiting a field-based food technologist.
- The importance of working with and strengthening local community institutions.
- The importance of focusing on providing economic incentives responding to credible researched market incentives.

The report does not offer a reflection on what worked well and what did not in relation to admin and management, nor what could be done differently next time, which may have been valuable given the unique challenges faced by this project.

## **11. Project Budget**

The project report tabulates Grant expenditure in 2017/18 against total actual cost. No variance is recorded against any budget lines. The explanation provided is that the University of Stirling provided the project with additional financial support over and above what was budgeted for, and presumably all budget lines had therefore been exhausted.

## **12. Key Facts for Defra Publicity**

The project has undertaken important research into female led alternative livelihoods options in Sierra Leone. It has worked with and built the capacity of local female headed community institutions.

The project has secured 5 years of post-project funding by the Whitstable Oyster Company to support the implementation of marketing interventions that have the potential to have a significant impact on local incomes.

The project has undertaken valuable research into the fuel efficiency of different primary and secondary oyster processing methods, identifying upscaled oyster steaming troughs that, if rolled out, could significantly reduce fuel wood demands from nearby mangrove forests.

The project was featured in an article in The Sunday Times:

<https://www.thetimes.co.uk/article/from-whitstable-to-west-africa-how-kents-oyster-farmers-are-taking-their-shucking-expertise-to-sierra-leone-7xskrp55g>