Final Evaluation Report

We ask all grant recipients to complete a project evaluation that helps us to gauge the success of your project. This must be sent in **MS Word and not PDF format**. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please DO NOT fill in and submit this form until the project has been completed.

Complete the form in English. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

Your Details	
Full Name	Hari Priya Eswaran
Project Title	Participatory mapping to understand the ecological impacts of trawl fishing in the critical seagrass ecosystems of Palk Bay, Tamil Nadu, India
Application ID	39862-1
Date of this Report	31.03.25

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Co-create spatiotemporal maps with fishing communities, showing the extent of trawl fishing in Palk Bay			Fully achieved	With the GPS data collected in collaboration with fishers, we generated a map of the fishing grounds where the trawlers fish in Palk Bay waters. This was the first time our research team engaged in participatory research with trawl fishers. Although we initially planned to collaborate with two trawl boats, only one ultimately agreed to participate. The main reason for the reluctance among other trawl owners was the requirement to record GPS points for the study. The trawl fisheries in Palk Bay are largely stigmatised and vilified as the ones causing the destruction of marine resources. Therefore, in the Palk Bay, data collection is viewed with apprehension due to the ongoing transboundary fishing conflicts between India and Sri Lanka. Accessing fishing grounds is also a subject of significant geopolitical tensions between Sri Lanka and India, and these trawlers are very sensitive to sharing such information. Consequently, it was challenging to build trust and secure participation. Finally, one trawl owner and crew recognised the value of the research and actively contributed to our study. While our study is restricted to one

				boat, just the data from this one boat has been revelatory. It has shown how bottom trawlers utilise fishing grounds. Our work in this area has helped us build trust with the fisher communities and also paves the way for greater participation in future work and critical discussions around fisheries management.
Identify locations of potential nursery grounds indicating a high juvenile abundance of commercial species.		Partially achieved		We proposed to map the locations with high juvenile abundance of commercial species. However, we could not map the juvenile abundance of all species due to the challenges of identifying specimens at the species level due to their damaged condition. Moreover, we depended on the secondary literature available for size at first maturity (Lm) to achieve this objective, which was not reported for many species. Therefore, we aim to re-strategise our methodology, collect species-level data for representative species for this objective, and generate maps in post-project duration. Number of samples collected: The boats in our field site go fishing three times a week. After onboarding the boat for data collection, we collected over 25 samples during the study period. However, we aim to continue the sampling as part of our long-term participatory monitoring of fisheries catch in the Palk Bay region. Number of species identified – We were able to identify more than 20 species, including the species that were also sought for local consumption. Our analysis highlights the significant

				overlap between the species consumed and those diverted for fishmeal and fish oil production, implying a serious threat to local food security.
Develop maps demonstrating the spatial distribution of the IUCN red-listed species in Palk Bay waters.			Fully achieved	No VU, NT, EN, or CR species were found in our sample catch. Therefore, we could not generate maps for the IUCN red-listed species. Instead, we added the IUCN status as an additional layer to the trophic level database.
Understand the ecosystem's trophic levels and community structure by analysing the trawl bycatch caught in Palk Bay.			Fully achieved	We developed a database of trophic and community structures for the identifiable species. This database will enable us to observe long-term trends and monitor the health of the Palk Bay ecosystem through participatory fisheries monitoring.

2. Describe the three most important outcomes of your project.

a). This project has laid the foundation for participatory research in Palk Bay, focusing on large-scale fisheries. We utilised this opportunity to collaborate with the local fishers and community members in data collection and analysis. Given the unsustainable nature of trawl fisheries and geopolitical sensitivities in this region, a significant amount of time went into successfully onboarding the fishers for the participatory work, which we have also highlighted below in section 3.
Through this project, we strengthened our relationship with fishers and contributed to the capacity building of the local youth who worked with us as 'Ocean Stewards'.

As part of the study, we hired four ocean stewards, young members of the fishing community who were mentored to participate in long-term monitoring of the marine resources available in their local area. This initiative was part of a larger, long-term vision to empower coastal youth to participate in regional fisheries management and conservation by integrating traditional ecological knowledge with conventional scientific approaches. Our study built upon this initiative and further encouraged them to undertake other short-term projects in their own capacity, including documenting traditional fishing methods that are gradually declining alongside seagrass ecosystem services. We would be happy to share details on the short projects by Ocean Stewards.

To mentor and onboard ocean stewards for this project, we conducted over 7 workshops. These included an introduction to onboard data sampling, the importance of participatory research, data collection and management, and documentation and presentations. These workshops were conducted throughout

the project duration as needed and were repeated to provide a better understanding and gather feedback. We also visited fish landing centres to conduct scoping of the field site and gain a better understanding of the landscape.

b). Our study provides comprehensive insights into species, quality, and quantities of fish diverted from Palk Bay to the Fish Meal Fish Oil (FMFO) sector. In 22 samples collected during the project duration, over 36 faunal groups were recorded. Additionally, a key insight includes a significant overlap of 88% in species groups between the locally consumed species and those being diverted for reduction, raising concerns about food security, equity, and resource utilisation.

c). This project offered an enhanced understanding of the ecological and socio-economic issues associated with trawl fisheries. There is a significant gap between the theoretical frameworks for adaptive co-management versus the practical challenges we experienced during the implementation of this project. We look forward to working more on that front and including region-specific nuances to co-management frameworks in the coming years.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

1. The participatory GIS and research with fishers pose their own unique challenges. Palk Bay region is highly sensitive due to its geopolitical history with Sri Lanka. These trawlers often cross the International Maritime Boundary to fish on the Sri Lankan side, leading to diplomatic tensions between the two countries. As a result, fishers initially showed hesitation in collaborating, particularly in sharing GIS data on fishing tracks.

To address this, we prioritised building rapport and trust with them before starting data collection. We ensured free, prior, and informed consent and maintained transparent communication regarding the project's objectives. This process eventually helped us persuade one boat owner to collaborate with us.

2. Additionally, unpredictable weather conditions disrupted fishing activities, protests due to geopolitical conflicts, and low fish catch reduced our opportunities for onboard sampling. To mitigate this, we adapted our research timeline and requested Rufford for a no-cost extension until March 2025, allowing us to increase our sample size and maintain the project's scientific integrity.

4. Describe the involvement of local communities and how they have benefitted from the project.

A significant portion of the project's data collection was conducted with the Ocean Stewards. They are the local community members identified to equip them with the necessary tools to best understand fisheries management and local governance. As part of their training, they developed skills in marine resource monitoring, enhancing their involvement in fisheries management processes.

Additionally, this project served as a catalyst for deeper conversations on the future of trawl fisheries in Palk Bay. Alongside other ongoing action research, this work paves the way towards sustainable and equitable fisheries management in Palk Bay.

5. Are there any plans to continue this work?

We plan to build on this work by expanding our research to explore the socioeconomic and nutritional security impacts of bycatch diversion from trawlers. This involves continued collaboration with fishers and other relevant stakeholders across the value chain and understanding trade-offs between FMFO production and local food security.

6. How do you plan to share the results of your work with others?

We plan to disseminate our findings through community consultations with fishers in Palk Bay, particularly those directly and indirectly involved in the project. We will also utilise Dakshin's social media platforms, conduct workshops and write popular science articles to showcase our work. These discussions will ensure the insights gained are shared and accessible to all, fostering further collaboration and dialogues on sustainable fisheries.

Additionally, we aim to publish our results in peer-reviewed journals and conferences and contribute to the growing body of evidence on the impacts of bycatch diversion. By doing so, we hope to inform policy discussions and encourage inclusive interventions addressing ecological and socioeconomic challenges associated with trawling in Palk Bay. We are planning to submit our work to journals like Frontiers in Marine Science and Marine Policy under Elsevier. We are building on the manuscript and integrating it with other aspects of our work, including the socio-economic implications of bycatch diversion to the fishmeal and fish oil sector in India.

We are currently working on streamlining the long-term conservation plan and fisheries management in the Palk Bay region. Addressing sensitive issues like this one, which intersect with livelihoods, fisheries sustainability, and geopolitics, requires a nuanced approach. An approach that needs to be backed by strong support and trust from the trawl fishing community, along with a long-term commitment to improving the current state of the landscape, is essential.

One of the key objectives of our research is also to understand what brings fishers into bottom trawling and what keeps them motivated to continue despite the emerging challenges that they face today. The trawling in this region is no longer as economically viable as it was decades ago. Therefore, in our socio-economic surveys, fishers express a keen interest in changing their occupation and moving away from trawling, particularly for their next generations. We envision using this narrative as a key argument to bring about inclusive and sustainable transformations in Palk Bay.

Vilifying and stigmatizing them by certain conservation groups and fisheries managers had led to a stalemate. Our work indicates that bottom trawl fishers are looking out for alternative exit pathways. The current challenges of debt traps, perverse market incentives, and the livelihoods of boat crew members are preventing them from moving away from destructive fishing practices.

Our approach is novel in that we are trying to understand what challenges the trawl boat owners face, finding opportunities for trawl boat owners to exit this fisheries and finding a middle ground where meaningful, empathetic solutions can be developed, which leads to a win-win situation for both the trawl fishers as well as the oceans.

We are also in the process of making a documentary film to attempt a creative and visually engaging form of communication and knowledge dissemination, highlighting the story of the unsustainability of fishing in Palk Bay from both sides. Instead of vilifying trawlers, the documentary aims to emphasise the need to move towards inclusive pathways and highlight the importance of including all fishers, including trawlers, in those conversations. To pursue Dakshin's long-term interest in navigating challenges to sustainable fisheries in Palk Bay, we hope to get continued support from donor agencies like Rufford Foundation, which understands that conservation and social justice go hand in hand.

In September of this year, we successfully conducted an in-person event to showcase the insights gained from this project. This was during the one-year completion ceremony of the Ocean Stewards Initiative in this region. The event was attended by officials from the district's fisheries department, including the Deputy Director of Fisheries for Ramanathapuram, along with the Assistant Directors of Fisheries for Rameshwaram and Mandapam. This event was also attended by local panchayat leaders, whose villages were the sites of data collection and the areas we plan to expand. The discussion was led by ocean stewards themselves, which served as a testament to the fact that, given ample opportunities, fishers, especially youth, are well-equipped to discuss their own local marine issues and participate in fisheries management. Here is the link to the social media post about the ceremony.

7. Looking ahead, what do you feel are the important next steps?

1. One of the crucial steps is to share our findings with wider stakeholders, including academicians, fishers and grassroots organisations working on this front. This will help draw attention to the issues and foster collaborative discussions on sustainable transformations.

2. Building on the momentum of this project, it is crucial to deepen engagement with trawl fishers on this subject area, strengthening participatory research for more inclusive and community-driven solutions.

8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

We will feature Rufford's logo in the final versions of the training modules we have developed for sampling and species identification purposes. We are also going to include the logo in the upcoming MARE 2025 People and Sea Conference paper presentation, highlighting the ground insights gained from the project.

9. Provide a full list of all the members of your team and their role in the project.

Core Team Members:

1. Hari Priya Eswaran

a. Co-led project conceptualisation, budgeting and objective setting.
b. Co-developed training modules on onboard sampling, species identification, etc.
c. Co-designed and implemented the sampling strategy in collaboration with ocean stewards.
d. Conducted workshops and consultations with fishers and ocean stewards regularly.
e. Performed data analysis and reporting.
f. Overall, proactively involved in managing project and outputs.

2. Meghana Teerthala:
a. Actively involved in project conceptualisation and objective setting.
b. Contributed to developing training modules - onboard sampling, species identification, etc.
c. Proactively contributed to implementing the sampling strategy with Ocean Stewards.
d. Performed data analysis and reporting.

3. Abhilasha Sharma:
a. Actively involved in project conceptualisation and objective setting.
b. Oversaw the overall progress of the project and proactively contributed to the troubleshooting processes.

Ocean Stewards Members (4 members)
Piyo Lijora, Maria Hotlin, Daniel Vinoth and Initha Prakasi
a. Ocean Stewards are local community members working in Dakshin's Ocean Stewardship initiative. It aims to bridge the gap between local traditional knowledge systems and scientific ways of monitoring and fisheries management by equipping local youth with the necessary tools to understand local governance mechanisms.
b. Co-led data collection and entry.
c. Helped build rapport with trawl fishers and proactively communicated the project's aim and objectives during regular fieldwork to fish landing centres.

10. Any other comments?
A combination of factors resulted in a lower number of samples than we expected. These include:

1. Delay in identification and onboarding of boat owners to collaborate with due to the sensitivity of trawl fisheries as an occupation in Palk Bay,

2. Less number of fishing days due to erratic weather, fishers protests, local festivities and two months of monsoon fishing ban,

However, this experience enhanced our understanding of the local trawling-related issues and also helped us gain key learnings towards replicating and scaling participatory GIS and onboard sampling across the Indian coast. The rapport built with the trawl boat owners and local fishing communities during the project duration will be instrumental in conducting long-term research and enabling sustainable interventions in this region.

ANNEX – Financial Report

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