

The Rufford Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other 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. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs please send these to us separately.

Please submit your final report to <u>jane@rufford.org</u>.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Shreya Yadav
Project title	Climate change, reef recovery and the role of early life- history in structuring coral communities in the Lakshadweep atolls, India
RSG reference	14277-1
Reporting period	1 year
Amount of grant	£5820
Your email address	shre2624@gmail.com
Date of this report	10.11.2014



1. Please 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
How does the availability and stability of settlement structure vary across the atoll chain?			Yes	Photo-quadrats were used to document the structural composition and substrate type of 12 sites on three atolls in the Lakshadweep Archipelago.
Do coral genera with differing life-history traits make different settlement choices? If so, what are the consequences of these choices for the cohort? Are certain life-history characteristics more 'successful' than others on some reefs?		Yes		The focus of these questions changed slightly in the course of the project (please see details on outcomes below)
What is the relationship between these early life-history processes and adult benthic composition? How does this relate to the resilience and recovery potential of a given reef?		Yes		The data for these questions has been collected but will have to be compared with previous work from these islands to answer these questions fully.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

3. Briefly describe the three most important outcomes of your project.

- This study has established how the structural composition of reefs in the Lakshadweep varies across the atoll chain. Since over 85% of most reefs here are composed of dead structural forms, they form the primary surfaces on which new coral settlement can occur. We used photo-quadrats (n=288) to quantify percent cover of dead structural types (massive, branching, platform, table, consolidated rubble, unconsolidated rubble) and the substrates they are covered in (crustose coralline algae, turf algae, macroalgae, sand).
- 2. We are finding that the settlement "choice" made by coral recruit's changes with structural type. For instance, some structures like massive forms and tabular coral seem to be preferred for coral settlement over forms like unconsolidated rubble and branching forms. This is most likely driven by differences in substrate composition of these structures—some, like the massive and tabular forms are covered in crustose coralline algae, a substrate that acts as a positive cue for coral settlement to occur. We compared the abundance of coral recruits (<1 year) with adults on these structural forms and have found that final coral mortality changes significantly with structural type.</p>



3. The differences in coral mortality with structure seem to correspond exactly with that individual structure's mechanical stability, indicating that some "stable" structural forms are more suitable for the long-term survival of coral recruits. This is because of their morphologies and differences in mechanical stabilities in the face of hydrodynamic stress. In essence, longer-lasting dead structures (with highest stabilities) support maximum survival of coral recruits. This will have important consequences at the reef scale, where reefs dominated by dead, stable structures are more likely to recover faster than those dominated by dead, unstable structures because of their differing abilities in influencing coral survival.

This work initially proposed to look at how different coral life histories differ in the settlement "choices" they make and what this means for their final survival. While conducting the study however, we found it more useful to first establish more general patterns of coral recruitment and survival. Now that we have a starting point, it will be easier, and more interesting, to see how this change for different coral life histories. The data for this has already been collected and only needs to be analysed.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Our work in the Lakshadweep is only possible because of the sustained and continued support we have received from the island's locals. All the fieldwork in this project, including the diving and travel to and from different islands was achievable only because of the commitment of three very able field assistants.

Ecologically, this project has established that the stability of different structural forms, and therefore of entire reefs, is a critical mechanism driving the survival of coral recruits, influencing the recovery trajectory a reef will potentially take post-disturbance. This will be important from a management perspective as it will allow us to identify reefs that are most likely to benefit from fishing closure/protection and those that might already be too far down the line. We are currently working on a research paper that tries to relate the findings of this study to previous work to see whether the recovery trajectories the team at NCF have been observing for the past 15 years can be explained by this variation in structural type and stability.

5. Are there any plans to continue this work?

Yes, we plan to continue this work next season (2015) and collect more data if necessary.

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

We are currently working on two scientific papers for international peer-reviewed publication that will be submitted for review by late 2014 or early 2015.

7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?

The grant was used for 1 year as planned.



8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budgeted	Actual	Difference	Comments
	Amount	Amount		
Field accommodation for 6 months	360	357	3	
Boat costs- fuel and repairs for 6	1500	1491	9	
months				
Field assistants (2) for 6 months	1080	1070	10	
Travel	760	797	-37	
Dive equipment and maintenance	120	134	-14	
Living allowance	2000	1962	38	
Totals	5820	5811	9	

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

I first plan to publish the results of this work, as it might be useful for people working in similar systems around the world.

The next step will be to monitor some coral recruits on different structures over time, to get very precise values for coral mortality rates. It would also be useful to see how coral genera influences survival—are some able to do better on a wider variety of structures than others? We already have the data for this, but it will need to be analysed and written up for peer-reviewed publication.

Finally, the reefs in the Lakshadweep will have to be monitored over time to see how their structural composition changes with season and disturbance. Will this match with our predictions on how they "should" recover, based on structural type and coral recruit survival? If so, a management plan for these reefs will have to incorporate this very critical mechanism contributing to benthic recovery.

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

I have not yet used the logo in my work (as it hasn't been published yet) but the Rufford Foundation was acknowledged for financial support in the presentations I have made so far.

11. Any other comments?

I'm very grateful for the RSG for supporting this work. Thank you!