Final Project 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.

Complete the form in English and be as concise as you can. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

Your Details	
Full Name	Chiara Pisapia
Project Title	2016 mass bleaching event in the Central Maldivian archipelago
Application ID	21185-2
Grant Amount	£5000
Email Address	Chiara.pisapia.1@gmail.com
Date of this Report	20/11/2017

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
Investigate whether juvenile density (recovery potential) vary spatially among reefs			■	We revisited all our sites and added three new sites. We investigated changes in coral cover and coral size population structure following bleaching. We also investigated spatial variation of juvenile corals and compared juvenile abundance with data pre-bleaching (data I recorded during one IUCN expedition in 2015). We also measured size of juvenile corals to distinguish juveniles that joined the population before versus after the bleaching. The number of juveniles following bleaching was substantially lower.
Build capacity and improve local awareness			■	We involved students (mainly female), lectures and teachers at the Maldivian National University, high profile resorts in the country and local dive centres.
Investigate and quantify the effect of bleaching on reefs			■	The data were collected in the Central Maldivian Archipelago and results will be available in the paper that will soon be published in scientific reports. Overall coral cover declined from around 40% to less than 5% due to the mass bleaching event and ongoing outbreak of cots. Coral cover profiles varied among sites, with some sites showing less than 2% live coral cover and some showing higher cover than others (never >10%).

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

We engaged a higher number of citizen scientists this year, however we noticed that a large proportion of people living in community islands have not experienced or seen coral reefs up close, mainly because they do not know how to swim. The number of people able to participate to in-water activities was limited. We committed to collaborate with a local NGO to teach a selected number of community members to swim and snorkelling on the reef so they can better understand and protect this amazing ecosystem.

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

1) A field-trip for Maldivian undergraduate students from the Maldivian National University (NMU). Students and teachers learned the most important sampling techniques for coral reef ecosystems. Importantly, most of the students were female. We had a higher number of teachers and students involved this year compared to the 1st grant indicating that the impact of our work is increasing.

2) We collected critical data on coral communities following the 2016 mass bleaching event, which allowed measuring the severity of the event.

3) We did generate data on coral reef resilience that are of immediate relevance to the conservation and management of Maldivian reefs. We are in the process of sharing our data on the effect of bleaching and potential for recovery with the scientific community and the public with a publication in the high profile open access journal scientific reports and with a summary video inclusive of interviews.

    a) Three Maldivian scientists and one citizen scientist will be involved in the peer review paper in the Nature publishing group.
    b) Several resorts (including One and Only Reethy Rah, Gili Lankanfushi, Velidhoo, Halaveli and Big W) were heavily involved in the work we did in the country. We did strengthen our relationship with them so that they committed to work with us in the future.

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

The 1st RSFG put the basis for our long-term monitoring programme and with the 2nd RSG we were able to include more sites, strengthen old relationships with the Maldivian National University, and high profile resorts. We were also able to develop new relationships (e.g. local NGO to develop swim/snorkeling lessons to reach a larger number of people). This project increased environmental awareness in the Maldives by involving 55 students from the NMU, local marine biologists working in high profile resorts, Maldivian scientists and local dive centres. Three Maldivian scientists are also involved in the publication of the results from this study. Marine

biologists from resorts and dive centres were involved in the collection of data, we also organized meetings with resort managers, and wrote a report for each resort. We interviewed and filmed most people that were involved in the project.

5. Are there any plans to continue this work?

Yes absolutely. The second project in Maldives was truly a wonderful experience. We built upon the success of the 1st project and could expand our impact both from a scientific standpoint and increasing awareness of reef conservation. Rufford Grant allowed us to collect critical data on the effect of the mass bleaching. Revisiting the same sites in 2018 will be critical to investigate recovery trajectories. Importantly, we have quantified the severity of bleaching on coral assemblages, it will be critical to also investigate consequences of bleaching for fish assemblages.

We increased local awareness by collaborating with the University in Male (MNU) and with different high profile resorts in North Ari and North Male atolls. The number of students, lectures, teachers, resident marine biologists and dive centres that wanted to be involved increased since 2016! We can reach even more people next year, especially if we develop swimming/snorkelling lessons. It will be critical for us to continue to strengthen old relationships with the University and resorts. We are also building upon a relationship with a local NGO to increase environmental awareness in the Maldives by involving citizen scientists and reaching to local Maldivians who do not how to swim.

We are also planning on extending our project for few more months (up to 15 months) to increase our great impact in the country.

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

We are summarising all our findings in a peer review papers (to be submitted before Christmas). We chose a very high profile paper, which is also open-access so everyone can access it. We have been already very active on social media (especially Twitter) sharing updates from our project.

Data were already presented to the scientific community in the US will also be presented at the ECRS in Oxford. The ECRS will be a great opportunity to share our data as all coral reef scientists will reunite to discuss climate change. We will upload all our data in the journal website so local managers and policy makers can easily access them. All the resorts and dive centres we worked with have already our raw data so they can use them to better manage their reefs. And we will use the social media page for local marine biologists in the country to share our results.

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

We used the grant from January to November 2017

8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion. All prices are in sterling to avoid confusion

Item	Budgeted Amount	Actual Amount	Difference	Comments
Field work course MNU	370	900	530	We had a higher request to attend.
Boat	3500	3500		
Field consumable	600	600		
Underwater camera	500	0		We did not purchase any new camera. We used Chiara's personal camera to reduce costs.

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

We were already able to reach a larger number of people compared to last year and we are very excited for our future. The first key step will be to continue to strengthen our relationships with the Maldivian National University and resorts as everyone committed to future collaborations with us. The second step will be to develop a relationship with a local NGO and collaborate to teach most Maldivians to swim/snorkel so we can reach an even larger number of people. It is hard to convince community members to maintain the health of coral reefs when a lot of the time, these members of the community do not get the opportunity to swim / snorkel and see what they believe to be protecting, or they do not have the capacity to implement good practices even if they wanted to. As a result, fostering stewardship in these communities is extremely challenging.

Lastly, it is critical to continue monitor our long-term monitoring sites to investigate recovery trajectories and also quantify the effect of mass bleaching on fish assemblages.

10. 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?

Yes absolutely, we used the logo in two big seminars in the US (Scripps Institute of Oceanography in San Diego and Nova University Florida), we included the logo in each summary we wrote for each resort we worked with and we used the RSFG with Maldivian National University.

RF will continue to receive great publicity with the planned publication in Nature Scientific Reports (submission planned before Christmas) and we are also in the

process of uploading a YouTube video showing some underwater work we did and interviews of local people and scientists about the bleaching. The Centre of Excellence for Coral Reef Studies James Cook University (Australia) will probably arrange a press release (we will keep you informed).

We will also use the RSGF at the European Coral Reef Symposium in Oxford (Dec 2017) during which I will present our work in the Maldives.

We have also heavily advertised our project and Rufford Foundation through social media.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

The team is exponentially increasing. Mr Riyaz Jauharee is a senior researcher at the MRC - Maldivian Government and he is heavily involved in teaching at the Maldivian National University. He organized and helped teaching the field-based course in sampling techniques for undergraduate students.

Ms Deborah Burn is one of the marine biologist in a resort in North Male atoll and helped with data collection.

Mr Rilwan Yoosuf, Mr Ahmed Najeeb and Mr Amhed Basheer helped with field logistic. In addition, we had 5 more resident marine biologists and 4 dive centres involved in data collection. We interviewed most of them so they will appear in the summary video we are preparing.

12. Any other comments?

Thank you so much for supporting our work in the Maldives. After only 2 years we saw great benefits of our work and we are very excited for the future.

Thank you so much for making all this possible.