

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 | Sebastian Brackhane |
| Project Title | Community-based Monitoring of Saltwater Crocodile (<i>Crocodylus porosus</i>) in Timor-Leste |
| Application ID | 20437-1 |
| Grant Amount | 4900£ |
| Email Address | Sebastian.brackhane@felis.uni-freiburg.de |
| Date of this Report | 22 November 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 |
|--|--------------|--------------------|----------------|--|
| To gain more detailed knowledge of <i>Crocodylus porosus</i> ' population, distribution and biology in Timor-Leste | | | | Already in the beginning of the project it was clear to us that a comprehensive and fully assessment of the crocodile population in Timor-Leste would not be possible with the financial and technical capacities available. Crocodile monitoring in remote areas can be very costly and sometimes require surveys from the helicopter. Therefore, our main goal was to gain sufficient data on crocodile habitat to identify priority areas for management and future research. A methodology to develop a preliminary, national habitat map was elaborated in the project and is currently under review with an international peer-reviewed journal. |
| To get a better understanding on the spiritual status of crocodiles among different regions and ethnics in Timor-Leste | | | | 122 interviewees participated in our online survey. In addition, community members and local authorities in seven communities affected by HCC could be interviewed. However, the 60 survey sheets distributed to local community members were never returned to us. Consequently, the results of the online survey are not representative, but nevertheless indicate ambiguous attitudes towards crocodiles in Timor-Leste. Major results of the online survey were published in the progress report, which can be downloaded from the Rufford Foundation website. |
| To give management recommendations with respect to local traditions, values and expectations. | | | | Since we closely cooperated with the Crocodile Task Force Timor-Leste through our team member Flaminio Xavier, as well as with local authorities, we were able to elaborate recommendations for |

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| | | | | crocodile management in Timor-Leste which we think reflect the expectations of all Timorese citizens and especially local stakeholders. |
| 4) a) Providing a local warning system for rural communities and tourists to inform about areas of potential risk and current crocodile observations. b) Integrating local authorities and local ecological knowledge holder into the crocodile management process c) Enhancing capabilities to gather local data on crocodiles in Timor-Leste | | | | The website www.common-environment.org and the web tool "Crocodile Mapper" could be successfully extended. Yet, a translation from English into Tetum could not be processed within the project duration. The crocodile mapper was tested during field surveys as well, but local authorities lack computers and access to internet for frequent data entry on the local level. We recommend community maps and mapping programs to assess local ecological knowledge during field surveys, but we could not observe a frequent data entry independently made by local knowledge holder in the absence of the researchers. |
| 5) Organizing a national workshop for national experts and local authorities associated with crocodile management | | | | This workshop would have exceeded the proposed budget. We decided to rather spend the money for an extended field trip inviting some potential future leader for crocodile management in Timor-Leste. |
| 6) Establishment of a data infrastructure and teaching Geographic Information Systems (GIS) to Timorese crocodile managers | | | | A dataset with 130 crocodile attacks could be compiled. The open access program QGIS could be taught to staff of the Biodiversity Directorate and the Center for Biodiversity and Climate Change at National University of Timor-Leste (UNTL). Finally, a national crocodile risk map and a preliminary habitat map could be developed in collaboration with the Crocodile Task Force Timor-Leste. |
| 7) Processing and packaging the system for other countries in the region in similar | | | | The crocodile mapper can be transferred to other regions on request and without additional costs. |

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| situations such as West Timor and other parts of Indonesia and Southeast Asia | | | | |
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.

Planning for trips to Timor-Leste, but especially to rural communities required a lot of flexibility. Communication with national and local authorities was sometimes difficult, as the access to internet and email-services is very limited throughout the governmental agencies. The Ministry for Commerce, Industry and Environment, for example, did not provide any access to the internet for the staff of the Biodiversity Directorate, our main project partner. A lot of re-planning and re-budgeting was required to achieve the goals set in the proposal.

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

- a) The elaboration of the most comprehensive crocodile attack and crocodile habitat maps for Timor-Leste.
- b) The first standardised (although not fully representative) survey on cultural attitudes towards crocodiles in Timor-Leste.
- c) To develop and showcase a technical system which is open access and allows for standardised and cost-effective assessment of wildlife distribution data

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

Local authorities, including traditional elders, and other local stakeholders, including subsistence fishermen, were crucial partners for the project. In fact, the success of the project widely relied on the provision of local ecological knowledge. In our project we were able to showcase how local stakeholders can play a significant role in contributing wildlife data, especially in remote areas in rough terrain where crocodile monitoring is costly and requires advanced techniques. We showed that community-based monitoring has the potential to deliver data for preliminary crocodile habitat maps by simultaneously integrating rural community members into the research or management regime. Furthermore, we were able to assess local, traditional attitudes towards crocodile through interviews and online surveys. This allows us to give recommendations for tailored crocodile management in Timor-Leste, which meets the expectations of local people.

5. Are there any plans to continue this work?

Yes, we would like to use the findings generated during the project to:

- 1.) Conduct professional monitoring in the identified priority areas.
- 2.) Develop a management programme tailored to the unique situation and attitudes towards crocodiles in Timor-Leste.
- 3.) Test the hypothesis raised by local authorities indicating that migratory crocodiles from Australia, where saltwater crocodile populations have reached carrying capacity in many places, cause the increasing numbers of crocodile attacks in Timor-Leste.

For the future research in Timor-Leste we plan to apply for funding from the Rufford Foundation.

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

General project information is provided on the project website www.common-environment.org. The data assessed during the project duration allowed us to draft three manuscripts for submission in internationally recognized scientific journals. Furthermore, the two Timorese project members Flaminio M.E. Xavier and Dr Marcal Gusmao became member of the IUCN Crocodile Specialist Group and are now part of an international network of crocodile experts. A link to the project is also provided on the website of the Chair for Remote Sensing and Landscape Information Systems at University of Freiburg, Germany.

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

The project could be conducted as anticipated in the proposal with a delay of one month (November 2016 – 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.

| Item | Budgeted Amount | Actual Amount | Difference | Comments |
|---------------|-----------------|---------------|------------|--|
| Flights | 1000 | 1827,70 | -827,70 | It was budgeted for one flight (return). In the end, two flights (return) were necessary to conduct field surveys in both, the rainy and the dry season. |
| Accommodation | 0 | 1584,60 | -1584,60 | Other than planned, it was not possible to get accommodation at no cost. |

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| Transport (Car, driver, motorbike) | 3000 | 1013,84 | +1986,16 | We were able to save some money here, as the Biodiversity Directorate kindly funded one field trip and provided a driver for the other. |
| Conference with local stakeholder | 980 | 0 | +980 | A conference with all local authorities would have exceeded the budget by several thousand pounds. |
| Server and Domain, Internet, Survey Monkey | 730 | 559,38 | +170,62 | The Biodiversity Directorate agreed to cover the costs for the server after completion of the project. |
| Total | 4900 | 4985,52 | -85,52 | Additional funds were raised through the Student Research Assistance Scheme of the IUCN CSG |

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

It will be crucial for public safety along the Timorese coast to draft a crocodile management plan, which meets the expectations of local stakeholder. The basis for a management regime will be a professional crocodile monitoring starting in the locations identified as priority areas for management. It remains subject to future research to assess sufficient data on the crocodile population as basis for the management plan. The population status of *Crocodylus porosus* according to IUCN Red List criteria may remain in the category Data Deficient.

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?

The Rufford Foundation logo is shown on the project website as the main funding organisation (www.common-environment.org). The Rufford Foundation is acknowledged in two manuscripts which are currently under review in international scientific journals and another manuscript which is currently in preparation for submission to an international peer-reviewed journal.

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

 IUCN Crocodile Specialist Group added a new photo.
 May 18 · ©

Name: Flaminio Xavier
 Location: Dili, Timor-Leste
 Organisation: Direcção Nacional de Protecção e Recuperação da Biodiversidade, Direcção-Geral do Ambiente, Ministério do Comércio, Indústria e Ambiente (MCIA).
 Main Involvement with Crocodylians: Research, Management, Government authority, Tourism, Education, Zoos/Wildlife Parks.
 Current Projects: Community-based monitoring of Saltwater Crocodiles in Timor Leste and responsible for the Centre for Crocodile Management in Hera, ... See More



Flaminio Xavier

Flaminio M.E. Xavier: Flaminio is Head of the Crocodile Task Force Timor-Leste and the key person for crocodile management in Timor-Leste. He played a crucial part in planning the field surveys and providing information on crocodile habitat and crocodile attacks.

Dr. Marcal Gusmao: Marcal is Deputy Director with the Center for Climate Change and Biodiversity at the Universidade Nacional Timor-Lorosae. He supervised the scientific part of the project.

Octavio Araujo: Octavio is a Timorese national studying M.Sc. Environmental Governance at University of Freiburg in Germany. He designed and conducted the online survey.

Mirko Mälicke: Mirko is a research associate with University of Freiburg and kindly developed and administrated the project's website and also developed the Crocodile Mapper.

12. Any other comments?

We would like to thank the Rufford Foundation, especially Jane Raymond, for the kind support.

 IUCN Crocodile Specialist Group added a new photo.
 May 9 · ©

Name: Marcal Gusmao
 Location: Dili, Timor-Leste
 Organisation: Centre for Climate Change and Biodiversit, National University of Timor orosa'e (UNTL)
 Main Involvement with crocodylians: Research, Management
 Current Projects: Community-based monitoring of Saltwater Crocodiles in Timor Leste... See More



Dr. Marcal Gusmao

Some pictures from field work:



Figure 1: Field survey in Baucau in February 2017.



Figure 2: Saltwater crocodile in Lake Iralalero in February 2017.



Figure 3: Crocodile habitat in Lake Iralalro.



Figure 4: Local stakeholders in Com.



Figure 5: A Saltwater Crocodile is fed in the Crocodile Research Center of Hera.