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	Notahiny ZAFINDRETSABA
Project Title	Development of village fish farming in Ambondrolava, South-West of Madagascar
Application ID	Rufford I.D. 43002-1
Date of this Report	13/12/2025

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
Identify the problems related on fish farming and suggest improvements for the sector.			X	The surveys of 120 households and two focus groups of 25 people identified the main obstacles to develop the fish farming (lack of financial resources and materials, poor technical skills, marketing difficulties) and areas for improvement (cooperatives, training, capacity building, security).
Analyze sediment qualities, soil grains sizes			X	Three samples taken from three basins were analysed in laboratory. The granulometric results provided useful information on the texture of pond sediments. These results were used to correct the final version of my bachelor's report, as required by examiner (Bachelor's thesis presentation), before submitting it at Institute of Fisheries and Marine Sciences (IH.SM) library, University of Toliara.
Physicochemical parameters monitoring of seawater in fish ponds (pH, salinity, dissolved oxygen, turbidity)		X		The monitoring was carried out during one fish farming production cycle in three basins. However, some measurements could not be covered regularly due to cyclone passage. Nevertheless, the data collected already allows for an initial assessment of water quality.

Mapping potential fishing farming Areas at Ambondrolava			X	Participatory mapping has made to identify the potential areas for fish farming, surrounding ecosystems, empty and operational ponds.
Strengthen fish farmers' knowledge on association management, manual sexing techniques or fingerlings, pond maintenance, soil fertilization, fish feed production, and fish breeding cycle.			X	The theoretical and practical training enabled fish farmers to acquire skills in fish sexing, biomass management, feeding, and association management. The local communities' participants showed good assimilation of the concepts and an interest in applying what they had learned. A log notebook fish farming production was introduced to record the progress of their harvests.
Educate and raise awareness among villagers about the importance of environment, mangrove and marine ecosystems (seagrass bed, coral reef).			X	The environmental awareness and education sessions were successful. Community understanding of environmental issues is improving, though continued efforts are needed to ensure broader acceptance of integrated marine and terrestrial environmental protection laws. This is particularly important given that most of the local communities are comprised of farmers, fishermens and herders.

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

a). Increase of fish ponds numbers:

The project successfully stimulated the increase in the number of fish ponds in use and the rehabilitation of abandoned fish ponds in the Ambondrolava zone. This expansion reflects a growing willingness of households to invest in aquaculture as an income-generating activity. The increase in the number of ponds and fish farmers (35 households in 2024, compared to 49 households in 2025) directly contributes to an improvement in local production capacity and thus to the availability of fish for food

consumption and sale. This result also demonstrates the beneficiaries' long-term interest and commitment.

- Before project (86 ponds), in 2023:

Number of fish ponds in use: 38 ponds

Number of unused fish ponds: 48 ponds

- After project (91 ponds), in 2025:

Total number of fish ponds in use: 54 ponds

Total number of unused fish ponds: 37 ponds

b). Raising household awareness about the benefits of fish farming:
The six awareness-raising and environmental education sessions strengthened local communities' understanding of socio-economic and environmental benefits: improved food security, income diversification, and reduced pressure on marine fishery resources, as well as marine and terrestrial ecosystems. This shift in perceptions marks a positive change in community vision: aquaculture is no longer viewed solely as a complementary activity, but as a sustainable alternative capable of supporting local development.

Approximately arounds 180 villagers attended the six sessions.

- 1st session: Project presentation and research findings (bachelor's thesis), discussion and exchange on challenges related to aquaculture development in the zone

- 2nd session: Importance of mangrove and back-mangrove ecosystems

- 3rd session: Importance of coral reef, seagrass, and forest ecosystems

- 4th session: Presentation of study results (bachelor's thesis), problem identification, discussion and exchange with the 2 fish farmers' associations in the zone (villagers of Belalanda and Ambondrolava). Ambondrolava is located 3 km north of Belalanda (Municipality).

- 5th session: Local management and governance

- 6th session: Presentation of project results, PowerPoint presentation on "aquaculture as a lever for development in Southwest of Madagascar," followed by discussion and exchange on project continuation.

c). Acquisition of practical skills by fish farmers:
The training sessions strengthened the technical capacities of 30 fish farmers (14 womens and 16 mens), particularly in essential areas such as manual sexing of

fingerlings, biomass management, fish feeding, pond maintenance, and association management. Participants now have practical tools to improve productivity and reduce losses, ensuring greater autonomy for fish farmers and the sustainability of the activity. They are satisfied with the training and participate actively.

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

a. Economic precarity of local communities:
Many families lacked the financial means to construct suitable fish ponds or to acquire necessary equipment (water pumps, fish fingerlings). This limited the adoption and expansion of aquaculture at the community level in the municipality.

Solutions provided:
The project encouraged the establishment of fish farming cooperatives to share costs (membership in fish farmers' associations and construction of collective ponds, group purchases of materials, group purchases of fish fingerlings).
Technical support (production of various fish feeds) and targeted material assistance (fish fingerlings, spades, and especially a water pump to facilitate water intake and drainage) will be provided in the second phase of the subsidy request to alleviate the initial burden on fish farmers.

b. Effects of Climate Change (Flooding):
The intensification of rainfall during Cyclone "Jude" passage in Madagascar in March 2025 caused frequent pond flooding, resulting in fish losses.

Solutions provided:
An adaptation strategy was initiated, notably adjusting the breeding calendar to avoid periods of most intense rainfall. The diversification of species more resistant to climate variations (such as tilapia) was also encouraged to reduce risks related to climate hazards.

c. Insecurity and Theft:
Some ponds suffered fish theft, which discouraged certain farmers and hindered confidence in the activity.

Solutions Provided:
Encouraging local communities to practice aquaculture. If everyone has fish ponds, this will reduce theft. A proposal to develop local rules or DINA (traditional law) was made in case of reported theft.
The establishment of village surveillance committees will be strongly encouraged in collaboration with local authorities (Fokontany or village chief, municipality, and

gendarmerie) in the second subsidy request. The collective approach will strengthen security and restore fish farmers' confidence.

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

The surveys and focus group discussions were organized to identify existing problems and gather their views on aquaculture development. Two representatives of fish farmers actively participated in zone mapping, verifying ponds containing fish, unused ponds, recording GPS points, and delimiting areas of Vondro or typha cultivation as well as locally managed mangroves.
To monitor the evolution of their production, a production register notebook was provided to fish farmers' associations. Furthermore, exchange and discussion sessions were organized during all awareness-raising and environmental education activities, reflecting the active engagement of local communities.
They also benefited from theoretical and practical training to strengthen their competencies in various techniques: association management, manual sexing of fingerlings, pond maintenance, soil fertilization, fish feed production, and monitoring of breeding cycle. These activities enabled communities to better understand aquaculture challenges and progress in their farming sustainable practices.

Awareness improvement was monitored through focus group discussions conducted before and after the sessions. Participants were asked questions to assess their knowledge of aquaculture and environmental conservation. Increased participation in fish farming activities (increase in the number of basins that have been redeveloped and reused) and improved pond management practices were also observed.

5. Are there any plans to continue this work?

Yes, I planned to continue this project.

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

- Online Publication: Activities and results are regularly published on the Toliara Eco Restoration organization's Facebook page, to be disseminated to a wide audience. For example: www.facebook.com/share/p/17AUXCsf1q/
- Events and Stands: We present our results in poster form at World Oceans Day and World Environment Day events, promoting direct exchanges with visitors.
- Official Presentation: Our activities are also presented during the quarterly review organized by Direction Régionale de l'Environnement et du Développement Durable, in the presence of all environmental stakeholders, enabling institutional and technical sharing of projects results.
- The results were presented at a meeting held at the end of the project.

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

The next important steps are:

- Consolidation of technical and organizational achievements:
  use of production registers and adoption of a production calendar to avoid periods of intense rainfall and minimize losses
- Strengthening awareness-raising and environmental education sessions:
  on local governance, the importance of back-mangrove and marine ecosystems, on the advantages of aquaculture in terms of food security, preservation of natural resources, and creation of local employment
- Provision of quality fingerlings to fish farmers, which will promote fish growth and reproduction.
- Equipment provision: Water pumps to drain ponds, spades, and fish ponds for the 2 fish farmers' associations (in Ambondrolava and Belalanda)
- Academic valorization and research for obtaining a Master's 2 degree on "management of broodstock sex-ratio as an alternative to hormonal masculinization of fish farming."

The production of predominantly male populations in tilapia represents a major challenge in aquaculture. Males generally exhibit faster growth and better production efficiency than females. Under natural conditions, the sex-ratio of this species is often imbalanced in favor of females, with an approximate proportion of one male for three females, which limits the achievement of batches with high male dominance.
Faced with this constraint, the use of masculinizing hormones currently allows reaching high, even total, proportions of males. However, this practice raises environmental, health, and ethical concerns, justifying the search for more sustainable alternative methods. Some fish farmers also report that, despite a higher number of females, the male effectively mates with only a portion of them, suggesting that reproductive dynamics and parental sex-ratio could influence offspring sex.
In this context, the present work aims to evaluate the effect of broodstock sex-ratio management on the proportion of males obtained in tilapia fingerlings, without recourse to masculinizing hormones. The main objective is to determine whether it is possible to achieve a male proportion exceeding 80% solely through adjustment of the reproductive sex-ratio.
The study will be based on experimentation under controlled conditions, comparing different broodstock sex-ratios and analyzing their influence on offspring sex-ratio. The expected results could contribute to the improvement of aquaculture practices by proposing a biologically and ecologically acceptable alternative without hormonal masculinization chemical.

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?

The Rufford Foundation logo was properly used on all projects supports (PowerPoint presentation, poster, attendance sheet, payment statement, and on the guide booklet distributed to fish farmers) during project implementation.
Thus, during our work, publications of content on our Facebook page were made mentioning the Foundation's support, as well as in the poster presentation during our participation at the World Oceans Day stand.

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

- Notahiny ZAFINDRETSABA, Project Leader: responsible for operational and technical implementation of the project, report writing.
- Joel Arnaud MASOAVA, Technical Assistant: support to all projects activity implementation, awareness-raising, data collection, and report writing.

10. Any other comments?

We wish to express our profound gratitude to the Rufford Foundation for its financial and moral support in implementing this village aquaculture development project in Ambondrolava. This support not only enabled us to strengthen the technical and organizational capacities of fish farmers, but also to educate and raise awareness among local communities about the importance of preserving marine and coastal ecosystems.
This project has demonstrated that village aquaculture constitutes a sustainable alternative, capable of generating income, strengthening food security, and reducing pressure on marine resources. However, significant challenges remain to be addressed, particularly regarding adaptation to climate change, pond security, and infrastructure sustainability.

We are convinced that the continuation of this work, through ongoing training, production monitoring, equipment provision to fish farmers, and research, will amplify the positive impact on local communities, thereby strengthening the promotion of the blue economy in our region.

ANNEX – Financial Report

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