

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 jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

| Grant Recipient Details | |
|----------------------------|--|
| Your name | Tausi A. Khitentya |
| Project title | Environmental Education and Community Involvement towards Conservation of Endangered Tilapia <i>Oreochromis amphimelas</i> and its Ecosystem in Lake Kitangiri, Tanzania |
| RSG reference | 18379-1 |
| Reporting period | January 2016 to January 2017 |
| Amount of grant | £4948 |
| Your email address | tkhitentya@suanet.ac.tz |
| Date of this report | February 2017 |

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 |
|--|--------------|--------------------|----------------|--|
| <p>Assessment of current social economic contribution to the environmental problems facing <i>O. amphimelas</i> and its ecosystem in Lake Kitangiri Tanzania</p> | | | | <p>Fishery, crop cultivation, livestock grazing and firewood collection are major economic activities of the community around Lake Kitangiri. Nearly all the activities are performed in an unsustainable manner.</p> <ul style="list-style-type: none"> • In fisheries there is application of illegal fishing gear and methods which are not friendly to the aquatic environments. Poor fishery activities are contributing to destruction and transformation of lake ecosystem. Also it is now well known by the researchers that there is destruction of aquatic plants associated by illegal establishment of settlement in the lake islands that result into destruction of breeding sites and nursery grounds of fishes. • Agricultural activity performed around the lake i.e. in low lands and high lands is a major source of soil erosion and siltation to the lake. Unsustainably people conduct their agricultural activities in areas with steep slopes as it results into soil erosion. During the rainy season water carries a huge volume of soil to the lake where it is forever deposited. • Also animal grazing contributes to the problems facing lake ecosystem because it results into erosion of the soil in high and |

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| | | | <p>low lands to the lake. This is a year round destructive activity because the grazers use searching for pastures and water. Also, during the rainy season eroded soil transported to the lake and being deposited in the lake for whole life.</p> <ul style="list-style-type: none"> • Further, we recognised that collection of firewood in the highlands around lake Kitangiri is among the major social economic activities of the lake community. This is a daily activity involves a severe deforestation that always disturbs the nature of the areas. Due to firewood being common source of energy for roasting, frying and drying fish products environmental problems remain a consequent and a long lasting unsolved threat of the endangered fish species of lake Kitangiri and its ecosystem. |
| <p>Provision of environmental education and raising conservation awareness of lake ecosystem.</p> | | | <p>Environmental education provided to the community help to raise environmental conservation awareness and changing behaviour of some people towards initiated conservation activities. Different groups were attended for training and discussions as follows.</p> <p>At schools:</p> <ul style="list-style-type: none"> • With a sounding theme 'Conserve lake Kitangiri ecosystem for our better life' the students were trained on the environmental conservation importance and their contribution on campaigning against destruction of lake ecosystem. A formal training and discussion raised awareness of the teachers and students as it insisted to strength their understanding |

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| | | | <p>towards conservation of the lake and its surroundings. In addition to that the students at Doromoni primary (Figure 1) and Tulya Secondary school were practically equipped on production of tree nurseries i.e. <i>Azadirachta indica</i> and <i>Melia azadirachta</i> and planting the trees within the school boundaries.</p> <p>At village/ward level:</p> <ul style="list-style-type: none"> • A public talk was one of the methods used to increase awareness of lake community (Figure 3). Through training and discussion a lot of information was collected from the attendants of this meeting. Their challenging questions, comments and recommendations towards lake Kitangiri ecosystem lead us to confirm that they are now aware of environmental problems and threats of endangered <i>O. amphimelas</i>. This talk and discussion contributed increasing environmental conservation awareness of the community. Hence, we are expecting that their attitudes and behaviour on the use of fishery resources had shaped and are going to be workable towards conservation of Lake Kitangiri. Further, they had an idea to restore the lake through planting of indigenous grasses and tree species in destructed areas of the lake surroundings in order of reducing siltation. However, as one of the mitigating actions the community agreed to closed fishing activities for 6 months (November 2016 to April 2017) to allow recovery of the |
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| | | | <p>fishery resources.</p> <p>At district level:</p> <ul style="list-style-type: none"> • A workshop training and discussion with the district authorities, village leaderships, NGOs, BMUs, natural resources officers and managers was mobilised to disseminate environmental conservation education. The findings from surveys were presented and the attendants involved for further contribution. Through discussion we realised that prior to this campaign there was no a serious precaution taken towards ongoing destructive activities. Therefore, below mentioned was advised to the attendants for the aim of raising their awareness: <ul style="list-style-type: none"> <input type="checkbox"/> To have regular assessment and monitoring of policy and institutional background of resource use and development. <input type="checkbox"/> Collaborating with the NGOs to collect resource use information and its sustainability. <input type="checkbox"/> To assess, arrange and control fishery migrants and number of fishing gears/vessels in order of improving managerial use of fishery resources. <input type="checkbox"/> To establish resource use assessment and the existing problems and challenges facing local fishery community with respect to fishery environment. |
| <p>Social events towards community participation in the protection of <i>O. amphimelas</i> and its ecosystem.</p> | | | <p>Game competition helped to mobilise and encourage the youth working together throughout the ongoing conservation activities. The event sensitised students, teachers and the community participating in</p> |

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| | | | the conservation importance of their surroundings. Furthermore, this aspect altered awareness of the community to understand and practically participate in protection of Lake Kitangiri ecosystem. |
| To mobilise formation of conservation network for Village leadership (Village government leaders, Environmental Committee-VEC, BMUs, natural resources officers, NGOs and environmental journalists. | | | Partially accomplished. In few conservation network has initiated at Doromoni primary and Tulya secondary school where by up to this reporting period both teachers and students started to participate on conservation of school compounds through planting of trees (Figure 2). |
| To conduct training for building the capacity of village leadership and journalists in collaboration with natural resources officers and NGOs, to augment efforts toward conservation of <i>O. amphimelas</i> and its ecosystem in Lake Kitangiri Tanzania | | | The key players of the natural resources were informed on the status of the lake ecosystem and to some extent trained and influenced to collaborate one another within their communities in order of strengthening and improving managerial knowledge, techniques and skills towards their conservation of the lake. Also journalists were capacitated understanding the quality and ongoing threats of Lake Kitangiri of which enough information from research findings was disseminated (and will be disseminated continuously). Then the journalists were accompanied to use current findings to inform the communities through mass media. |

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

During the project we had additional surveying activity than we proposed. It was a boat survey which helped us to collect real information concerns the endangered species of Lake Kitangiri and its ecosystem. However, the project faced some of the difficulties which lead to the failure to achieve some of planned activities as follows:

- During mobilisation of workshop training meeting some of the key players failed to attend a meeting due to distance from their homes to the meeting area, poor infrastructure and shortage of financial resources to cover transportation costs.
- Rejection of some people to attend a training meeting. Also during data collection some of the attendants delayed to provide real information about the lake and its surroundings.
- During a last field trip we failed to access fishing zones for further observation due to a decreased depth and volume of water in the lake (a fishing boat failed to move).
- Though of the achievement made through tree nursery production and plantation (Figure 2), shortage of water was a challenging factor of this activity. Further, the activity was drawn back due to few illiterate people normally were accessing the school compounds and picking up the planted trees.

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

a). Environmental education awareness and capacity building of the students, teachers, fishers, village and governmental leaderships through training, presentation and discussion.

Provision of environmental education helped to increase awareness of the youth and adults in understanding conservation importance of the lake and its surroundings. Also the students and teachers were capacitated on tree nursery production and tree planting in school compounds as primary conservation campaign in schools, homes and lake boundaries. Then environmental conservation campaigns through formation of eco-clubs and mobilised game competitions increased socialisation and relationship between school and community that will lead to long lasting conservation activities. Up to the reporting period of project teachers and students at Tulya Secondary School planned to expand and replanting other trees as well as fruity trees in school compounds. Further, provision of environmental conservation education to the community strengthened the stakeholder's awareness and understandings on the alarming status of the lake due to the impacts of unsustainable use of natural resources including fisheries resources.

At district level a workshop training and discussion helped the participants understanding the real status of the lake and the impact of anthropogenic activities to the health and existence of the lake. Additional to these both community and governmental authorities realised a reducing earnings and incomes.

b). Understanding the threats of lake ecosystem and community resilience. The researchers discovered different challenges and problems to the community associated by prolonged threats of Lake Kitangiri. It was shown that the fishermen suffer from reduced lake productivity. This is leading to them shifting to other lakes with expectations that they will be able to fulfil their requirements. Irregular shifting to other lakes is the result of their families and relatives remain uncared with no basic needs and sometimes results into family breakdown where by the men remain as the refuges of other lakes. Hence, through social economic survey the researchers noted that unsustainable use of the resources associated by poor management and lack of proper monitoring of the resources specifically fishery resources. Moreover, individual comments and ideals anticipate conservation actions of the lake and other terrestrial ecosystems. Therefore, the results was prepared and presented during training meeting with government leaderships, NGOs, BMUs and journalists. Likewise, they are expected to deriver cooperative conservation actions and collaborative management of the resources.

c). Accurate information through boat surveying

We have learned that there is the importance of accessing the area than only use of data from social economic survey. Through boat survey the threats of the lake was evidently pictured out. Among these are: (i) illegal and heavy use of beach seine; (ii) illegal introduction of settlements in the lake; (iii) a farm fishing (they use to fencing, feeding and trapping fish of different sizes); (iv) illegal ownership of parts of the lake (especially in breeding and nursery grounds) and (v) destruction of aquatic plants. Sometimes all these are associated results of long transformation of the lake ecosystem due to unsustainable fishing practices and other external destructive activities. The survey assisted the researchers to understand well the situation of Lake Ecosystem because some of the fishermen were hesitating to give real information. Thus, all these were observed as the major threats of the endangered *O. amphimelas* and other fish species as well as its ecosystem.

Also we were able to discover the common breeding sites and nursery grounds of the *O. amphimelas*. During survey some of beach seines collected from north-western zone of a lake had large number of immature endangered species of the lake while there was no any observation made on other fishing zones around the lake. Thus was confirmed that the fish are dominating in a small portioned zone of a lake. Notable, might be due to a reason that the area is somehow conducive for them to survive. Consequently, there is intensive illegal and overfishing in the area as

a result of low recovery of the endangered species. These situations are predicted be a source of targeted fish species to disappear while other fish species reduces. However, through this survey we satisfied to observe all existing threats facing *O. amphimelas* and lake ecosystem. Thus, the survey paved a way for restoration decisions.

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

At schools:

The students and teachers were involved in the activities to share their ideas. A training meeting on environmental conservation was an attractive means of transmitting conservational aspects to the students and teachers at both Doromoni Primary and Tulya Secondary School. It helps both teachers and students to trap conservational ideas and made them very easy to bring their views through discussion. Training enabled the students to understand the importance and quality of their surroundings. Further, teaching mode will help the teachers to improve understandings of their students during class hours. There after the mobilised eco-clubs will be the ambassadors of environmental conservation activities within and outside their community. Also the students gained different skills and techniques used in the production of tree nursery as well as management of planted trees. The skills will be applicable in conservation of their schools, homes and worldwide. Additionally, production of tree nursery will help the youth to employ themselves wherever they go. Game competition, discussion and public talks altered and improved socialisation among researchers, teachers and students as well as with the community in large and refreshed individual minds.

At community level:

The stakeholders from lake surroundings were involved in environmental conservation education training through mobilised formal meeting. Most of the individuals benefited through this training meeting are the fishermen of Lake Kitangiri from which they achieved the following:

- Ability to interact with other people and exchange their ideas through discussion that helps them to communicate and express themselves.
- Gained different useful conservative skills of the environments as well as understanding and strengthening their input on conservation of fishery resources.
- They were able to understand and differentiate the status of the lake through understanding the historical background and present status of the lake. Thus, they are able to interpret the situation of fishery resources and reduced earnings for their development.

- Public talks, presentation and discussion improved socialisation and refreshment of the community as it resulted into free talks and daily expression of the information between stakeholders and the researchers.
- Since initiation of this project stakeholders are expecting to benefit more during restoration of the lake due to the fast recovery of fishery resource form that their earnings will be improve.

The governmental authorities and NGOs:

Many years ago there was neither social economic survey nor boat survey conducted to assess the status of the lake and the factors affecting lake ecosystem. Thus present research will help governmental authorities and NGOs having up to date findings of the lake especial major threats of the lake, current status of fishery resources, community aspects in lake conservation and mitigating capacity towards the lake. Also the findings of the research will help them to manage the resource uses. Further, public authorities and NGOs are able to cooperate and generating their strategic plans and strengthening willingness among themselves.

5. Are there any plans to continue this work?

Yes we plan to continue with conservation activities of Lake Kitangiri and its surroundings. In addition to these work some of the conservation activities including nursery production and tree planting in the school surroundings were already put on actions.

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

- Presentation of the findings and discussion with other natural resources expertise during conference meeting i.e. annual RSGF conference meetings.
- Presenting and discussing field results with government authorities, NGOs and Journalists during workshop training.
- Publication of the findings on local and governmental newspapers/magazines. In the course of conservation education there is a programming lesson in a local radio in order to distribute the findings to the local communities.
- Airline communication with teachers to monitor progressing conservation activities and strengthening its developments.
- The manuscript is in progress to be submitted to the peer reviewed journal few days to come.

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

Most of activities of the project were done within twelve (12) months. We would like to proceed with this project to achieve conservation strategies.

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 Amount | Actual Amount | Difference | Comments |
|---|-----------------|---------------|------------|----------|
| Printing of the Rufford Fund Logo to the T-shirt of 100 eco club members for awareness campaign | 100 | 0 | 100 | |
| Purchase of 3 football | 60 | 63 | -3 | |
| Purchase of 3 netball | 30 | 55 | -25 | |
| 20 sets of pencil | 60 | 60 | 0 | |
| 6 reams of paper | 60 | 66.7 | -6.7 | |
| 150 note book | 100 | 120 | -20 | |
| Purchase of 3 black and white printer cartage | 180 | 193 | -13 | |
| Purchase of 2 coloured printer cartage | 160 | 168.5 | -8.5 | |
| Purchase of 10 sets of whiteboard maker pen | 40 | 40 | 0 | |
| Printing of 20 posters | 200 | 245 | -45 | |
| Purchase of 1 digital camera | 250 | 262.3 | -12.3 | |
| Printing of certificates for poem, football and netball winners (3 best winners each) | 18 | 0 | 18 | |
| Refreshment of 100 students from five schools for 2 days | 400 | 250 | 150 | |
| Refreshment for 30 members of beach management units for 1 day | 240 | 260 | -20 | |
| Refreshment for 10 teachers for 2 days | 80 | 105 | -25 | |

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| Refreshment for 20 government village leaders 2 days | 160 | 165 | -5 | |
| Venue and refreshment costs for quarterly meeting discussion and presentation for times | 400 | 430 | -30 | |
| Bus fare for two team members from leader from Dar es Salaam/Morogoro-Lake Kitangiri for 6 trips | 600 | 660 | -60 | |
| Bus fare for one representative from NGOs from Moshi to Lake Kitangiri for 6 trips | 120 | 115 | 5 | |
| Bus fare to two journalist representing ITIV and radio one media who are working around the Lake geographical boundaries | 80 | 77 | 3 | |
| Car hiring for 10 days during the field trips | 500 | 522 | -22 | |
| Accommodation and meal allowance for project members for 24 days in the field | 600 | 580 | 20 | |
| Accommodation and meal allowance for one representative from local NGOs for 7 days | 175 | 175 | 0 | |
| Lumpsum | 235.65 | 235.65 | 0 | There was fluctuation in some of the expenses which resulted into extra expenditure of contingences. |
| TOTAL | 4848.65 | 4848.15 | 0.5 | |

NB: There was a mathematical error during breaking down of this budget which led the difference of £100.00 of budgeted amount (i.e. was £4948.65 instead of £4848.65). However, the actual amount of this project was £4848.15
 Exchanging rate of local currency by 01.02.2016 was US\$ 2124.

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

- Increasing, encouraging and developing conservation skills in other districts around the lake i.e. Kishapu and Meatu districts to enable the whole lake communities to participate in conservation activities. Also formation of conservation network of Lake Kitangiri communities from three districts (Iramba, Meatu and Kishapu)
- To reduce environmental threats and promoting laws enforcing in management of other resources i.e. water, land and forest resources. It will be effectively done were by the resource officers from district authorities and the expertise from available NGOs like Sustainable Environmental Management (SEMA), World vision, PEML and YAZA investment will be practically involved.
- To promote and establish a strong conservation network towards conservation of degraded breeding sites and nursery grounds of endangered *O. amphimelas* and other fish species in the lake.
- To provide education and enough skills in supporting production of environmental friendly wood stoves and development of other alternative preservation methods of fish products.
- To encourage and support introduction of other economic activities i.e. bee keeping, chicken production to reduce fishery population of Lake Kitangiri while maintaining the use of natural resources.
- To establish and facilitate Participatory Learning and Actions (PLA) programming to increase understandings and building capacity of the resources managers from governmental authorities, NGOs and BMUs in monitoring of restoration activities.
- The key expertise will be involved in preparation of quarterly progressing reports regarding to developmental status of conservation activities, then achievements and challenges will be discussed together before delivered to the beneficiaries in form of leaflets and articles.

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?

Yes. The RSGF log was used in production of posters, presentation, trainings at the schools, periodical magazines/newspapers and acknowledgement was made during radio programmes.

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

12. Any other comments?

Conservational aspect:

- In view of the findings there are few observed areas for breeding and growth of endangered *O. amphimelas*. However, if restored and sustainably managed might sustain recovery of this species. Thus, I request for further financial support to accomplish targeted conservational activities of the species and its ecosystem.
- Since the destruction of lake ecosystem is the impact of many unsustainable resource use, we have a plan to effective involving other experts in fields like agriculture and energy sources for both dissemination of education and capacitating the community on sustainable practices or use of alternative use of the resources.

Appendix



Figure 1: Left to Right: training meeting with students at Doromoni primary school during dissemination of environmental education; An Eco-Club leader, Ms. Betsheba is demonstrating the importance of Lake Kitangiri conservation to the Club members; and Elaboration to the students on the biological needs of the plants.



Figure 2: Left: Is a local tree housing to reduce the effect of livestock grazed in school compounds. Right: The trees planted in a bare land at Tulya secondary school.



Figure 3: A meeting with stakeholders during environmental conservation campaign on Lake Kitangiri.



Figure 4: A Guest of Honor, Dr. Mshana (Biodiversity Conservationist-front right) providing the balls to a Second Master (front left) at Tulya Secondary school as a sign to open game competition.



Figure 5: Left: Principal investigator SQUAT at the right front line). Right: Football Eco club members at Tulya Secondary school before competition.



Figure 6: Netball Eco club team at Tulya secondary school



Figure 7: Left is the part of a lake covered by water during rainy season (March 2016) whereby few days later remained dry while highly silted as an impact of deforest and agricultural activities take place in the surrounding mountainous parts of the lake.