

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Enoch Gyamfi-Ampadu
<b>Project Title</b>	Community Engagement in Biodiversity Conservation and Monitoring through Spatial and Temporal Change Detection Analysis of Lake Bosomtwe Biosphere Reserve, Ghana
<b>Application ID</b>	35883-1
<b>Date of this Report</b>	19/07/2023

**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 undertake a spatial-temporal change detection of the Lake Bosomtwe Biosphere				The objective was successfully achieved. However, the spatial-temporal analysis carried out for the forest ecosystem (Bosomtwe Range Forest Reserve) in the Lake Bosomtwe Biosphere covered 18 (2004-2022) years instead of 30 years (1991-2021) as initially planned.
To undertake the planting of tree seedlings around the Lake Bosomtwe				The objective as successfully achieved. Through the project, 5,000 indigenous and 300 coconut trees were distributed in all 24 fringe communities for planting around the banks of Lake Bosomtwe.
To carry out awareness creation in 24 fringe communities for the conservation of the Lake Bosomtwe Biosphere.				The objective was successfully achieved.

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

**a).** Through the spatial-temporal analysis, the changes that have occurred in the Bosomtwe Range Forest reserve over the last 18 years at a 6-year interval, as well as their distribution, have been determined. This has been discussed and shared with the relevant stakeholders (communities, traditional authorities and Forest Services Division) to facilitate the development of efforts meant to curb further decline. Also, additional data has been obtained to determine the above-ground carbon stock and its distribution, the sequestration potentials as well as the tree species levels of the forest. This will serve as baseline information for the forest ecosystem in the Lake Bosomtwe Biosphere which can be used for future projects or research.

**b).** There has been the planting of 5000 indigenous tree species and 300 coconut trees around the banks of the lake in all 24 fringe communities. This will help to minimise the lake from siltation, stabilise the banks and create a congenial environment for fish species that have their spawning sites close to the banks. It is also meant to contribute to carbon sequestration as well as climate change mitigation and resilience-building measure. The coconut trees will also serve as fruits for the community when they mature and will also be used as revenue generation for community projects.

**c).** Beyond the project, the communities have committed to planting new trees and maintaining naturally occurring ones in their communities and on their farms. This will be a measure to increase the tree cover in the biosphere to serve as a climate change mitigation and reliance-building strategy. As a result of this, support was obtained from the Forest Services Division (FSD) to secure tree seedlings in June 2023 for planting in the 24 fringe communities. Lastly, there has been increased awareness among the 24 fringe communities on the need to contribute to the conservation of the Lake Bosomtwe Biosphere Reserve. They are much aware of the importance of the biosphere and the socio-economic as well as ecological benefits it provides for them. As such, they have committed to behavioural changes and minimising activities that are detrimental to the conservation of the biosphere.

The most significant achievement of the project is the planting of trees around Lake Bosomtwe. This is because the trees will help to mitigate climate change through carbon sequestration and help the communities to build resilience. The coconut trees will also contribute to the socio-economic conditions as well as livelihoods of the 24 fringe communities. Evidence in the communities indicates that the coconut trees planted by the communities in earlier projects have been used for community-based developments. Those planted through this project are expected to be used for similar developments when they mature.

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

There were challenges in obtaining cloud-free satellite imageries over the entire Biosphere covering 30 years (1991 to 2021) at a 5-year interval that was initially planned for the project. The approach adopted was to reduce the number of years to 18 years (2004 to 2022) at 6-year intervals.

Secondly, additional data was collected to carry out an above-ground biomass/carbon (AGB/AGC) and tree species biodiversity for the Bosomtwe Range Forest Reserve to augment the spatio-temporal forest cover change assessment. The inaccessible nature of some of the areas due to high mountains delayed the data collection process resulting in a delay of data collection. The measure taken to deal with the challenge was to use a random data collection approach but restrict the sampling points to accessible areas that will be representative enough for the entire area. Also, more local assistants were engaged to expedite the data collection.

Lastly, all the 24 fringe communities had their taboo days to be on Tuesdays (days where they don't go to the farm or the lake), which delayed the community forums, workshops, engagements and community radio programmes. Efforts were put in place by the team to do at least two community forums and radio programmes in a day to maximise the time. With regard to the stakeholder engagements and workshops, all the major stakeholders were brought together at one location to facilitate the meetings.

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

There are 24 fringe communities around Lake Bosomtwe, and they formed an integral part of the project. They were involved in the planting of the indigenous and coconut trees around the lake. The communities have been very instrumental and resourceful in tending the trees to ensure their effective growth to maturity. The communities were involved in all the dialogue forums (community forums, stakeholder engagements, workshops) and have initiated measures at the community level to conserve Lake Bosomtwe Biosphere. Lastly, Local assistants from the communities were also involved in the field data collection carried out in the Bosomtwe Range Forest Reserve.

**5. Are there any plans to continue this work?**

Yes, I intend to continue the work by seeking additional funding to plant more trees around the lake and to restore more degraded areas in and around the communities. It will include more fruit trees such as mango and avocado in addition to the indigenous trees and coconut. This is because the coconut and fruit trees will be a revenue generation for the communities to improve their livelihoods. The trees will also be a climate change mitigation measure in all the communities.

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

Summarised reports have been shared with the Forest Services Division, the communities, and the Department of Forest Resources Technology at KNUST. It will also be shared with other relevant stakeholders.

Furthermore, the findings of the spatial-temporal change detection, above-ground biomass/carbon, and biodiversity distribution modelling are being developed into two or three research articles for publication in internationally recognised peer-review journals. This will make the findings accessible globally.

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

The important next steps will be to continuously engage the communities to improve their contribution to the conservation of the biosphere and increase tree cover through planting. As part of it some incentives such as farm inputs, could be provided to enhance their farming.

Furthermore, funds will be sourced through grants to support the planting of more trees in the Lake Bosomtwe Biosphere and also for the provision of alternative livelihood training in the 24 communities. The trees will help to conserve the biosphere and be a vital carbon sink. The livelihood training could help the communities find alternative sources of livelihood to reduce the overreliance on farming and fishing which will minimise the pressure on the lake and forest resources in the Lake Bosomtwe Biosphere.

**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?**

Yes, the logo was used to produce pull-up banners and t-shirts for community-based activities. The use of the logo for these items served as visibility and publicity for The Rufford Foundation. The pull-up banner was used in the community programmes while the t-shirts were shared among the participants involved in the forums, workshops and engagements. Furthermore, it was emphasised in all the workshops, forums, and stakeholder engagements that the project was funded by The Rufford Foundation. The Rufford Foundation will also be acknowledged in peer-review publications as the donor/funder of the project.

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

**Enoch Gyamfi-Ampadu:** I served as the Principal Investigator and led all the planning and implementation of project activities.

**Patrick Elliot Ofose:** He served as the main liaison officer between the team and the 24 communities fringing Lake Bosomtwe. He led the mobilization of the communities for all the community forums, workshops and engagements. He was also involved in the distribution of tree seedlings and monitoring of planting activities.

**Clement Asare:** He is an official of the Forest Services Division (FSD) and was involved in the community-based activities as a Resource Person. He was also involved in the data collection in the Bosomtwe Range Forest Reserve.

**Obed Kwaku Yeboah:** He served as a project assistant and was involved in the community-based activities, monitoring of the planting activities in the communities and data collection. He is also involved in the compilation of the field data collection as well as the analysis.

**Ebenezer Dapaah:** He serves as a project assistant and was mainly involved in the data collection team. He was the main liaison officer between the data collection team and the local assistants.

**Delali Glakpe:** He was a member of the data collection team and assisted in the compilation of the data.

**Gareth Ama Gyamfuah:** She was involved in organizing the community-based organization. She was also involved in the data collection and led the compilation of the data for analysis.

**10. Any other comments?**

I am thankful to The Rufford Foundation for providing this grant. It has been instrumental in empowering the local communities to contribute to the conservation of the Lake Bosomtwe Biosphere. The funding has been vital as the project will contribute to achieving the Sustainable Development Goals (SDGs) 11 (Sustainable

Cities and Communities, 13 (Climate Action) and 15 (Life on Earth). The funding has also contributed to the collection of essential data for spatial-temporal change detection, aboveground carbon estimation and tree biodiversity modelling of the Bosomtwe Range Forest reserve in the biosphere.