

Final Evaluation Report

Your Details	
Full Name	Bageshwer Singh
Project Title	Ecological Assessment of a little-known Wetland, a Ramsar Site in Punjab, India
Application ID	31003-1
Date of this Report	October 5th, 2022

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 prepare the flora of the wetland including the terrestrial and aquatic plant species.				<p>A comprehensive list of floristic diversity of Kanjli wetland is prepared for at least 1 year of study.</p> <p>Brief notes on plant phenology were prepared during field observations.</p> <p>Plant checklist was classified using classification in 'The World Flora Online' and Exotic invasive species were identified from the database of Botanical Survey of India.</p>
To document the avian diversity of the wetland.				<p>Points were marked using GPS and bird surveys were conducted for the whole year.</p> <p>Observations on bird-habitat relationship were recorded for one season to examine the changes in bird community richness and diversity.</p>
To identify the ecological and anthropogenic drivers influencing the vegetation of the wetland.				<p>During field observations, several factors affecting the vegetation were identified and were discussed with the district administration for effective management.</p>
To create awareness among the local population and student communities about the importance of wetland as a biodiversity hotspot and introducing the concept of native vegetation through nature walks and other activities				<p>We involved students from local schools and conducted awareness sessions followed by nature walks.</p> <p>By involving the forest department, tree plantation was organised around the wetland area.</p> <p>District administration organised a Vaisakhi Mela in Kanjli Wetland to conduct awareness about importance of wetland.</p> <p>A formal collaboration with district administration is still underway. Once it is done, a Nature Interpretation Centre will be set-up at Kanjli Wetland.</p>

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

a). Generation of baseline data for biodiversity of the Kanjli wetland (floristic and avian diversity)

From the study area, total of 174 species of plants including two species of ferns (Ptreidophytes) and four species of bryophytes were identified.

More than 100 bird species were recorded from the area from personal observations and up to 149 species from data available on ebird. Bird species observed included migrant waterfowl and IUCN red-list species such as common pochard, woolly necked stork, bar headed geese, northern pintail, garganey, etc. The birds were photographed along with the notes on habitat, and observation date.

During the field work, observations regarding the other taxa were also noted. sambar deer, Indian golden jackal, Indian gray mongoose, wild boar were the mammals. Indian roofed turtle (*Pangshura tecta*), a freshwater turtle species was also observed, which was unrecorded in previous records of department of forests and wildlife.

b). Identification of threats on wetland's ecology and measurement.

Of the 174 plant species recorded from the study area, 19 were invasive alien species. *Eichhornia crassipes*, *Lantana camara*, and *Parthenium hysterophorus* which are regarded as the worst invasive species in the world are common in the Kanjli wetland. The recorded invasive species are native to other tropical and subtropical regions of the world such as tropical America, tropical Africa and Mexico. Moreover, nutrient enrichment from agricultural run-off, pollution from domestic sewage discharge, and from other non-point sources. The issues in management were highlighted in the local media and district administration and were also discussed with Sant Balbir Singh Seechewal who is a member of Parliament and member of Punjab Pollution Control Board.

c). Awareness creation

This project could successfully create awareness among local school children. It was done through an awareness session with the school children followed by a nature walk in the wetland and adjoining forest where students can learn about different resident and migratory waterfowl and vegetation. An eco-club was also established in the state-run school in village Kanjli with the support from school's administration. Nature walks were also conducted with participation of nature enthusiasts from around the city, and the activities were featured in print media and All India Radio.

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

The research component of the project concerned with for floristic diversity assessment largely went as planned with no major difficulty. There were some issues in preparing plant specimens for herbarium, so that had to be prepared again.

1. Due to COVID-19 related lockdowns, there was a challenge to hire project personnel to conduct bird survey due to which its execution was delayed, but we were able to collect a comprehensive data for at least one season.
2. The state elections in Punjab delayed some of our collaborative plans with the district administration since most of the officials were engaged in election related duties from last few months of 2021 to a few months of 2022.
3. Due to closure of schools and restrictions in gathering public, the awareness sessions and nature walks had to be halted for few months

Despite few challenges and some unavoidable delays, most of the project's objectives were achieved, and the extension activities will be continued in the future to increase our reach and for awareness creation.

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

There were several types of interactions with the local communities such as meetings and informal interaction during the field work. Vernacular names of different plant species were collected with the help of locals. The maximum involvement of local communities was through the awareness sessions with the school children and young conservationists. The district administration has developed a part of Kanjli Wetland into a tourist spot which is providing employment to few locals and a Vaisakhi Mela (Fair) was organised to increase tourism in the wetland.

5. Are there any plans to continue this work?

Yes, we certainly plan to continue this work by establishing formal collaborative actions with the district administration and department of forests and wildlife, Punjab to set up a Nature Interpretation Centre to spread awareness to the tourists using the data collected on biodiversity. Data collected from our Rufford project provides a baseline for further research. The partnerships and networks developed during this project and participation in the Rufford conference offer opportunities to expand restoration efforts. We plan to extend the current research and explore citizen science options to involve locals as well as gather more data on biodiversity.

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

Outreach material and presentations are being developed which will be used to spread awareness among college youth and for tourists at Kanjli Wetland. District administration will be involved to increase the reach.

The scientific understandings from the data collected as a part of project will be published through research papers and scientific articles. This will be shared with the general public and government officials who can use the data in making decisions for conservation of this wetland.

The presentation regarding the research was also presented during the Rufford Conference in Mumbai in November 2021, and the project's ideas and objective were presented during the presentation to engineering and management students in Thapar University, Patiala on Earth Day 2022.

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

We plan to write scientific manuscripts to publish the collected scientific data. The important step is to publish the results in widely read journals in the field of wetland ecology and to make the scientific findings more accessible to general public and local communities whose participation is crucial in sustenance of the ecosystem. This will be done through strengthening the eco-club programme of the schools and training young conservationists.

There are still some serious threats to wetland ecology due to alien species invasion, so we will seek support of government officials for the timely removal of water hyacinth from waterbody.

To involve the local communities, we are currently doing research on making handicrafts using water hyacinth and to create a viable market for its sale. The local communities will be involved which will not only help in regular removal of weed but also ensure economic gains to the locals.

To make the awareness programmes more inclusive, college students, government officials and other conservation organisations will be involved and using the citizen science approach along with nature walks to gather scientific data.

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?

In all the presentations, the Rufford Foundation logo was prominently displayed as supporting institution. In the keynote address by Bageshwer Singh, project coordinator in Thapar University, Rufford Foundation's logo was used in the presentation. All the scientific publications that we bring out in the future will also acknowledge the Rufford Foundation's contribution. The logo will also be used in the outreach material to highlight the biodiversity of Kanjli, which is under development. The role of The Rufford Foundation is also acknowledged in public events, awareness sessions and conferences.

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

Bageshwer Singh - Project Coordinator/Lead. Coordinator, project management and conducting awareness sessions, stakeholder meetings.

Jasdeep Singh and Navneet Kaur – Employed as field assistants for the project. Assisted in conducting the field work, data collection and to organise awareness programs in schools.

Dr. Tanvir Bakshi – Naturalist. Helped in conducting nature walks and volunteered in data collection.

Mr. Sahil Sareen – Naturalist and Entrepreneur. Supported the team in conducting nature walks during the project.

Ms. Pooja Chand – PhD Scholar. Volunteered in field work and identification of birds and designing field methodology.

Mr. Sipu Kumar – PhD Scholar. Assisted in developing methodology for conducting bird surveys and species' identification.

Dr. Amit Kumar – Scientist at Wildlife Institute of India. Advisor and supported in identification of plants.

Dr. Praveen Verma – Scientist at Forest Research Institute, Dehradun. He helped in identification of species of lower plants including bryophytes and Lichens.

Team of PAHAL who helped in managing the regular activities related to project.

10. Any other comments?

The project was carried out with the funds only from The Rufford Foundation, and it was a learning experience for the entire team. The RF project encouraged me and gave me confidence to carry out independent research projects and awareness programmes to work in conservation ecology. Moreover, because of RSG project, I was able to participate in the Rufford Conference and get in touch with grantees working in conservation throughout India. I appreciate the patience of The Rufford Foundation in extending my project when I was faced with some unprecedented delays.



Figure 1: Kanjli Wetland, Kapurthala, Punjab.