Conservation of Ganges River Dolphin through the involvement of local Youths as citizen scientist in Koshi River, Eastern, Nepal

FOURTH QUARTERLY REPORT

FEBRUARY 2023

The Rufford Foundation
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Himalayan Nature (हिमाली प्रकृति)
Himalayan Conservation & Research Institute

QUARTERLY UPATES

ACTIVITIES COMPLETED

1. **Conservation Outreach Program**
    - **1.1 School Awareness Program**
    - **1.2 Radio Jingle**
    - **1.3 Hoarding Board**
    - **1.4 Community Awareness Program**
    - **1.5 Dolphin Day Celebration**
2. **Threat and Hotspot Assessment**
3. **River Dolphin Survey**
4. **Habitat Monitoring**

Background

The River Dolphin conservation project is funded by The Rufford Foundation, implemented in Koshi Tappu Wildlife Reserve (KTWR) and buffer zone areas, particularly at the upstream of Koshi River. In the previous quarter, the inception meeting with the concerned key stakeholders, training to citizen scientists, community consultation and interaction, along with the socio-economic survey and data analysis, water quality and threats assessment in the upper section of Koshi River was concluded. Meanwhile, in this quarter, the following activities have been completed.

1. Conservation Outreach Program

For the conservation outreach program, besides the school awareness, other activities included a community awareness program, the development of a radio jingle and installation of hoarding boards to disseminate the conservation message among the targeted audiences.

1.1 School Awareness Program

As part of the conservation outreach program, school awareness program scheduled for 10 schools namely; Shree Aadarbhut Secondary School, Kaushika Secondary School, Shree Mahendra Secondary School, Saraswoti Secondary School, Prakash Secondary School, Mohona Secondary School, Shree Adarsha- Secondary School, Rastriya Secondary School, Jaladevi Secondary School and Kosi Bird Observatory (KBO), a research station for grass land and wetland birds was conducted and reached 1000 students with the aim of sensitizing the students about the River Dolphin, its ecological and environmental importance as well as their roles in its conservation.

To mark the positive and long-term impacts, the program had been well-planned, engaging, and aligned with the objective of the project and meticulously executed. Considering the previous experience, the presentation was kept simple for students and delivered in the Nepali language as well as the posters and brochures developed previously were also provided to widen the spectrum of their knowledge. In between the presentation, a relatable video of dolphins was also presented such that the students can grasp the information easily that remain in their memory for a longer term. Adding to this, to make the program more interactive and involving, the students presented their learning and information shared during the program. The awareness program made the students aware and comprehending which encouraged them to develop a positive attitude towards River Dolphin and its conservation.

In most of the schools, active participation from students was witnessed indicating their anticipation to learn about the new things that come along as well as engage in the program that would help to develop their confidence and might stand up or participate in dolphin and biodiversity conservation in coming days. It's important to note that a school awareness program is just one part of a larger effort in creating positive and supportive aptitude for dolphin conservation at their level. To access the program's effectiveness, in each school, a set of 15 questionnaires covering basic yet important information about River Dolphin was

introduced as a pre and post-program survey to access the knowledge and confidence of students on dolphins and the impact of the awareness program on them.

Table 1: School awareness program effectiveness

School Awareness Program-River Dolphin				
S. N	**Name**	**Pre-Assessment**	**Post-Assessment**	**Averaging**
1	KBO	9.33	69.7	60.44
2	Rastriya Secondary School	3.96	86.7	82.71
3	Mohona Secondary School	6.3	83.03	76.73
4	Jaldevi Secondary School	0.37	81.3	80.93
5	Kaushika Secondary School	6.48	86.29	79.81
6	Saraswoti Secondary School	5.45	83.64	78.19
7	Shree Adarsha Secondary School	7.08	93.5	86.42
8	Shree Mahendra Secondary School	7.67	62.33	54.67
9	Shree Aadarbhut Secondary School	2.94	75.33	72.39
10	Mahendra Secondary School	10.1	60.1	50
	Averaging			**72.22**

The average effectiveness of the program in terms of improving the knowledge and information regarding the River Dolphin from all 10 schools was recorded at 72.22%. In accounts to the pre-program survey, it was witnessed that only 0.37-10 % of the total participants from 10 different schools were familiarized and had a certain level of information regarding the River Dolphin while in the post-program survey, the knowledge and level of confidence of the participants had reached to 50-86.42 %. The acquired data has reflected the success of the program primarily to increase the knowledge and understanding of students about dolphins, leave them with better information, and more importantly inspire them to participate in conservation initiation. This improvement has been achieved through the well-designed program, active involvement of citizen scientists, project team members, and school staff. Positive feedback from the students and schools has been received. Students assure themselves to continue utilizing the information and resources received and inspire others to take a positive role in dolphin conservation.


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Picture 1: A-H: School awareness program conducted by the citizen scientist at different school located at the vicinity of project sit

1.2 Radio Program-Jingle

To reach out a wide range of audiences, 3 radio jingles were prepared and broadcasted through Saptakoshi FM: 90 MHz for 9 months from June 2022 to February 2023. In each day different jingle was broadcasted 4 times i.e. 8:05 am, 10:45 am, 4:45 pm and 6:30 pm time schedules, totaling to 1080 times with the maximum listener in the selected time period. Saptakoshi FM is one of the most listened FM stations in the project area with outreach in 7 districts of eastern Nepal, hence targeting to reach over 1 million audiences.

1.3 Hoarding Board

Two information boards (iron frame of 6 X 8 ft) were installed; one on the national highway near the Koshi Barrage in the Saptari district and the other at the headquarters of Koshi Tappu Wildlife Reserve (KTWR). These strategic locations were selected considering the flow of people and accessibility. The boards were installed with the objective to disseminate information regarding dolphins including; biology, behavior, and distribution of dolphins, as well as their status, threats to their survival, and legal provisions. Similarly, these boards are expected to encourage local communities and visitors to protect dolphin and their habitat, by avoiding activities that have negative impacts on them as well as intended to promote the conservation and management of River Dolphins and their habitat, through a partnership with the conservation partners and local communities.

Picture 2: Hoarding Boards Installed Koshi Barrage (Left) and headquarter of KTWR (Right)

1.4 Community Awareness Program

Four community awareness programs at different localities; Purnabas, Madhuban, Prakashpur, and Kusaha were conducted with the participation of 200 local people. The main goal of such a program was to sensitize the local people focusing on river-dependent communities regarding the River-Dolphin covering broader information including ecological and environmental importance, prevailing threats, conservation challenges, legislation as well as buy on their support in their conservation.

Table 2: Community awareness program effectiveness

Community Awareness Program-River Dolphin				
S. N	**Name**	**Pre-Assessment**	**Post-Assessment**	**Averaging**
1	Purnabas	2.13	66	63.87
2	Madhuban	13.93	76.74	62.81
3	Prakashpur	17.56	63.44	45.88
4	Kusaha	24	77.04	53.04
	Averaging			**56.4**

To assess the effectiveness of the program, a set of questionnaire containing 15 questions related to River Dolphin was introduced to understand the knowledge and confidence of the participants on dolphins and the impact of the awareness program.

The average effectiveness of the program in terms of improving the knowledge and information regarding the River Dolphin from all 4 communities was recorded at 56.4%. In accounts to the pre-program survey, it was witnessed that only 2.13-24 % of the total participants from 4 different communities were familiarized and had a certain level of information regarding the River Dolphin while in the post-program survey, the knowledge and level of confidence of the participants had reached to 63.44-77.04 %.

The data indicated that the program was able to deliver the intended objectives of the program i.e. upscaling the information and level of knowledge of the local people about the River Dolphin which will be beneficial for the conservation of River Dolphin in long run.

Considering the dependency of communities on river resources, especially fish and other aquatic species to sustain their livelihood, the program was even more relevant to them and expected to be sensible and responsible towards conservation as well as share the information to other people from their communities such that the conservation message will reach to wider people.

Picture 3: Community awareness program in the vicinity of river-dependent communities, Koshi River

1.5 Dolphin Day Celebration

The Dolphin day celebration was taken as an opportunity to outreach information regarding River Dolphin to wider audiences. As an important component of the project, we take this platform to celebrate Dolphin day at the schools via an intra-school drawing competition. Schools, where the awareness program has been conducted, were selected for this event and more than 500 students actively participated in this competition where they portrayed the drawing on the theme of River Dolphin conservation. The competition has further upscale their knowledge regarding dolphins as well as are keen to engage in conservation ahead if a similar common platform were provided. The 3 best pictures were awarded from each school as an encouragement. The involvement of the school, students, and teachers has made this event a grand success, and have committed to engaging their students in conservation activities and also sharing their learning and experiences with their fellow peers not limited to themselves.


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Picture 4: A-J;Awarding winner students with the price from the intra-school drawing competition

2. Threat and Hotspot Assessment

Based on the information from the questionnaire survey, 81% believed the number of River Dolphin has decreased as compared to previous, resulting from overfishing (59%) including use of electrocution and fish poisoning, habitat destruction (35%), deterioration in water quality (5%) and mortality due to entrapment in a fishing net (1%). To validate this, a threat assessment in the Koshi River was conducted covering 40 km of upstream from Chatara to Koshi Barrage and 5 km downstream from Koshi barrage to Gobargada. During the survey, threats like illegal fishing; recorded frequently, habitat encroachment, infrastructure development, mining, anthropogenic activities has been witnessed.

Picture 5: Glimpse of Hotspot and Threat assessment; A: Survey team looking forward hotspot and threats, B: Deep pool preference site for River Dolphin, C-F: Recorded prevailing threats during the survey.

Table 3: Recorded threats during the survey at the Koshi River

S. N	GPS Coordinate		Types of Threats
	Northing	Easting	
1	26.69976	87.07515	Land Encroachment for agricultural purposes
2	26.63204	87.00957	Illegal Fishing
3	26.58093	86.94309	Habitat Encroachment
4	26.81789	87.15169	Illegal Fishing

5	26.813401	87.153147	Sand mining
6	26.5548	87.93312	Washing and bathing
7	26.5306	86.92294	Koshi Barrage
8	26.52381	86.92987	Illegal Fishing
9	26.51989	86.93053	Illegal Fishing
10	26.51591	86.93084	Illegal Fishing

Figure 1: Recorded threats at the Koshi River during the survey

A total of 13 sites from Koshi River has been identified as a hotspot for River Dolphin. The site has been identified based on the field survey, previous records, and local people consultation. River dolphins mostly prefer the deep pool, meandering, and confluence areas, which was evident in this survey, as similar areas were identified as a hotspot in the Koshi River. Although, dolphin was not recorded in the upper section of Koshi River, the hotspot areas have been identified based on consultation with local people.

Table 4: Identified hotspot site of River Dolphin in the Koshi River

S. N	**N**	**E**	**Hotspot site**
1	26.69703	87.06326	Hotspot of Dolphin
2	26.67221	87.04321	Hotspot of Dolphin
3	26.65833	87.03866	Hotspot of Dolphin
4	26.63736	87.01752	Hotspot of Dolphin
5	26.59	86.96601	Hotspot of Dolphin
6	26.58205	86.94459	Hotspot of Dolphin
7	26.56234	86.93738	Hotspot of Dolphin

8	26.55045	86.93225	Hotspot of Dolphin
9	26.52383	86.92985	Hotspot of Dolphin
10	26.52145	86.92984	Hotspot of Dolphin
11	26.52028	86.93013	Hotspot of Dolphin
12	26.51476	86.9288	Hotspot of Dolphin
13	26.508475	86.910931	Hotspot of Dolphin

Figure 2: Identified hotspot areas for River Dolphin in the Koshi River

3. River Dolphin Survey

The River Dolphin survey was conducted during pre- and post-monsoon season in the upper section from Madhuban to Koshi barrage as well as the lower section from the barrage to Gobargada, nearby the Nepal-India border and conducted following the standard methodology in the boat-based survey. Seven citizen scientists participated in the survey, 2 in the front, 2 in the middle, and 2 in the back of the boat and maintaining the constant speed of the boat. Pre-survey was conducted in a major water channel in order to identify the hotspot site before the survey to avoid the miss count. During the survey, due consideration on the deep pool, meandering and confluence was given as dolphins preferably encountered in these habitats. Besides this, variables like the number of illegal activities, habitat type, sighting distance, shoreline distance, depth of water and sighting distance were also recorded which will be helpful in further assessment.

A total of 22 (18 Adults and 4 sub-adult) River Dolphin were recorded during the survey. After 2007 massive flooding in Koshi, River Dolphin was not recorded in upper section. Even in our survey, despite the meticulous survey, in upstream, we were unable to record their

presence while in the lower section of Koshi barrage, dolphins are readily recorded. The biggest constraint for their movement is the Koshi barrage itself, as the massive infrastructure right in the middle of river has fragmented their habitat and even the existing fish ladders are not functioning, escalating this problem.

Table 5: Detail information of the dolphin survey

S. N	GPS Coordinate		Numbers of Dolphins Sighted	Sighting Distance (m)	Distance from Shore (m)	Depth (m)	Boat Speed (Kph)	Flow	Habitat Type
	N	E							
1	26.52383	86.92985	1	3	120	5	2	Slow	Deep Pool
2	26.52381	86.92989	1	4	110	5.9	1.5	Slow	Deep Pool
3	26.52381	86.92987	1	4	110	8	2	Slow	Deep Pool
4	26.52246	86.92991	1	2.5	50	7	2	Slow	Deep Pool
5	26.52145	86.92984	3	1.5	15	8.5	2.5	Slow	Deep Pool
6	26.52129	86.92984	1	2	10	4	1.5	Slow	Deep Pool
7	26.52058	86.92995	2	4	12	5	2	Slow	Deep Pool
8	26.52028	86.93013	3	5	50	3	2	Slow	Deep Pool
9	26.51989	86.93053	1	2	10	4	2	Slow	Deep Pool
10	26.5192	86.93081	1	6	25	4.5	2	Slow	Deep Pool
11	26.51921	86.93081	1	7	20	4.6	1.5	Slow	Deep Pool
12	26.51922	86.9308	1	10	20	5.4	1.5	Slow	Deep Pool
13	26.51835	86.93057	1	2.5	30	6	1.5	Slow	Deep Pool
14	26.51591	86.93084	1	8	10	5.5	1.5	Slow	Deep Pool
15	26.51476	86.9288	1	0.9	50	5.8	2	Slow	Deep Pool
16	26.51128	86.92205	1	5	45	5.6	2	Slow	Deep Pool
17	26.50848	86.91093	1	2	10	6.3	2	Slow	Deep Pool
		Total	**22**						

Figure 3: Recorded River Dolphin in downstream of Koshi River


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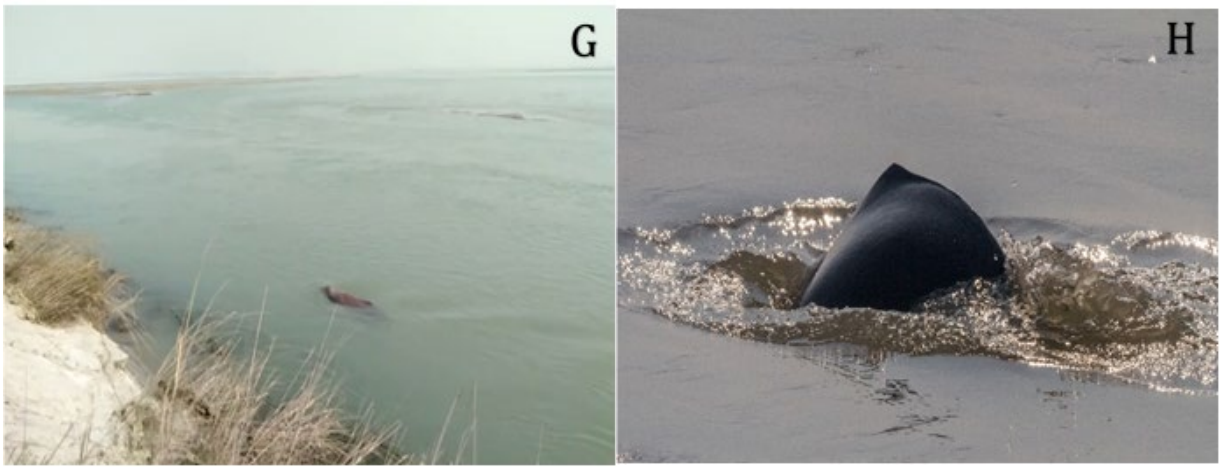

Picture 6: A-D: Glimpses of the dolphin survey involving citizen scientists and local resource person, E-F: River Dolphin sighted during the survey

4. Habitat Monitoring

The capacitated citizen scientist periodically monitors both the section of the Koshi River, primarily to record the presence of the dolphin as well as existing threats if any to them. The habitat monitoring was conducted bi-monthly where 5 citizen scientists actively participated in the monitoring at different sections of the river, prior to focusing on the hotspot and prominent human disturbance areas. A total of 18 such visits were made, where the participants not only limited to habitat monitor but also take this opportunity to sensitize and aware local people especially river-dependent communities or people engaging in fishing activities, and resource extraction that has negative impacts on the aquatic ecosystem, and ultimately to the dolphin, encourages them to bring changes on their current practices that are more amicable to aquatic life and consider less harm to dolphin survival.

Picture 7: Glimpses of the habitat monitoring by the project team in the Koshi River