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

## SECOND QUARTERLY REPORT

**JULY 2022**

© Chakra Timilsina

The Rufford Foundation
www.rufford.org @ruffordgrants

Himalayan Nature (हिमाली प्रकृति)
Himalayan Conservation & Research Institute

# QUARTERLY UPATES

## ACTIVITIES COMPLETED

1. **Inception Meeting**
2. **Focal Group Discussion with river-dependent community**
3. **Citizen scientist training**
4. **Conservation Outreach Program (Radio Jingle)**
5. **Socio-economic Survey**
6. **Threat assessment and population survey**
7. **Community Consultation**
8. **Habitat Monitoring**
9. **Future Plans**

## Background

The River Dolphin conservation project was funded by The Rufford Foundation and scheduled to be implemented in Koshi Tappu Wildlife Reserve (KTWR), upstream and downstream of Koshi River. In the previous quarter, groundbreaking work for the project has been completed including project approval from respective governmental entities, initial community consultation, and field visit. During this quarter, the following activities have been completed.

### 1. Inception Meeting:

Prior to start the project activities, an inception meeting was conducted on 11 June 2022at Prakashpur. A total of 28 participants (Male= 15, Female=13) representing KTWR, buffer zone, community forest, the local conservation organization, groups, local youths, and students' participant in the inception meeting (Annex= 1). The primary objective of this meeting was to share the insightful information regarding the project and its objective along with the expected outcomes and the activities of the project that will be conducted during the project tenure. In the meeting all the project information, including project purpose, planned activities and expected outcomes were shared through with the participants. Considering the expertise and experience of most of the participants bring, we took this opportunity to acquire more information regarding the River Dolphin their historical distribution and range, population, prevailing threats, roles and responsibilities of government and local people, and the way forward for its conservation.

The acquired information from the meeting helped the project to guide and effectively plan the project activities in the coming days. All the participants had positive expectations from the project, bringing all the entities together in a common agenda of dolphin conservation, and even want to express their desire to engage in the project activities. Additionally, all the participants admire the concept of citizen scientists, upscaling their capacity and more importantly engaging them in conservation activities ensuring the sustainability of the project and even encourage many other youths to engage in conservation activities. The meeting has successfully imprinted the idea of project activities and project goals to the participants that were envisioned to deliver.

*Picture 1: Principal Investigator (PI) presenting in the inception meeting (Left) and Group picture with the participants (Right)*

## 2. Focal Group Discussion with river-dependent community

Communities dependent on the Koshi-River and surrounding wetlands are scattered widely along the project area, where majority of these communities located in the upper section of the Koshi River in the Sunsari and Saptari districts. Since the Koshi barrage lies close to the Nepal- India border, as such we know very little information regarding the downstream (India side) community structure and their socio-economic dynamics. Considering these factors, the majority of the project activities will be focused on the upper section of the Koshi river although the River Dolphin existed mostly downstream of the Koshi barrage.

Two focal group discussions; (one at Darahara and another at Kusaha) were conducted with the river-dependent communities as their livelihood is largely sustained through fishing activities from the Koshi River. Beforehand initiating the discussion, the Principal Investigator (PI) and other team members highlighted the information regarding the project and its underlying components to the participants.

*Picture 2: Community structure (Left) and FGD with the local from Darhara (Right)*

During the discussion different information regarding the Koshi River, the myth and reality of dolphins along with other aquatic animals came along/at the surface. The majority of the fishing communities belong to Majhi, Malaha, Mukhiya, Judi, Sardar, Musahar, Sadha and Kabeta ethnic groups and have been practicing fishing for generations. They are expected to continue the fishing practice in the coming days since they lack alternate livelihood options, compelled to depend on Koshi for sustaining their livelihood. However, they are making very little money compared to earlier years, which barely covers their daily expenses after such a hardship whole day of work and many life-threatening risks. Similarly, to acknowledge their socioeconomic condition, the Koshi Tappu Wildlife Reserve (KTWR) has issued fishing licenses to the above-mentioned marginalized and ethnic communities. Every year each individual has the renew the permit for the fishing license primarily in the upper section of the Koshi River and the core area of the KTWR. Fishing in the wildlife reserve has been prohibited from July to September for three months. The majority of their acquaintance follow safer fishing practices using homemade fishing gears (Pakhure Jaal) and avoid destructive gear (Maha Jaal, Gill Nets) while other people outside their communities uses destructive fishing practices like use of fish poisoning, electrocution etc.

These communities symbolized River Dolphin as a god of fortune and protector and worship it, avoiding killing or harming these species. Many of them have also recognized its importance in the river ecosystem. Despite these facts, many of them are unaware that this species has been listed as a protected species by the Nepal Government and killing them for reason is liable to punishment (imprisonment or fine).

Most of them believe that the construction works, habitat fragmentation, water diversion, increase in fishing intensity, fish poisoning and electrocution practices have acted act as catalysts to exponentially reduce fish diversity and quantity in the river. Apart from this, different point and non-point sources of water pollution mainly discharge of wastewater, chemical runoff, waste dumping, and dredging have further escalated the threats.

This discussion session was fruitful to get the information from them and understand their perception, their knowledge, and roles in order to preserve these majestic species in their natural habitat. Though both communities had similar perceptions of dolphins, the majority of them lack proper information. This project can bridge the information gap, through several conservation outreach programs and interventions.

*Picture 3: Discussion with the fishing communities at the bank of Koshi River (Left) and fishermen engage in fishing (Right)*

### 3. Citizen Scientist Training

The concept of Citizen Scientists, particularly in scientific research, is gathering steam around the world. Citizen scientists in conservation and science-driven environmental research projects are a relatively new concept in Nepal, where people from various disciplines help collect, analyze, and interpret data. It has multifaceted benefits because it allows for the collection of real data from the field, the development of human resources at the local level, and, most importantly, the acquisition of reliable, authentic, and credible information that adds value to research. Their participation in research has become a means of encouraging curiosity and a better understanding of science, while also allowing for unprecedented interaction between professional scientists and the general public.


*Picture 4: Principal Investigator (Left) and Resource person (Right) during the three-citizen scientist training program*

Three days training to citizen scientist was organized from 13- 15 June 2022 at Koshi (the project site). The training program drew a total of 20 participants, mostly youths from various organizations. The main objective of this training program was to improve their

capacity and enhance their ability in commencing the research of River Dolphin and utilize their skill in the project activities.

First two days were focused on covering theoretical information on many aspects of conservation, dolphin survey methodologies and their relevance. On the third day, the participants were taken to the field visit for the practical implementation of information and knowledge acquired in the theoretical session. Apart from this, the local experts on biodiversity conservation were outsourced from Koshi Tappu Wildlife Reserve (KTWR) and local conservation organizations where they shared their experience and guidance with the participants. Their participation throughout the entire course and their confidence were laudable, as they are now able to carry forward the information when required. Likewise, the participants were well informed about the importance of the River Dolphin, and their role to balance the entire freshwater aquatic ecosystem and different standard methodologies followed for the dolphin survey. As the program progressed, the participants were introduced to the equipment used in the dolphin survey such as GPS, digital camera, binoculars and telescope as well as the procedure and the digital tool- Kobot for the questionnaire survey. They were also given information on assessing the physio-chemical parameters of water. Moving forward, the trainee was allowed to handle the equipment independently, identify the problems encountered while using or handling equipment and collect feedback.


*Picture 5: Principal Investigator (PI) highlighting the methodology and datasheet regarding water quality assessment, threat assessment and population survey*

The third day was particularly focused on the practical application of the knowledge, for which the participants were taken on a field trip to the nearby Koshi River. During the field session, all participants were given hands-on experience with the methods they learned during the first two days of training (theoretical session). They were allowed to use the equipment independently, fill out the datasheet, and learn about the River Dolphin habitat.


*Picture 6: Handed over the medical kits to the leader of Dolphin Conservation Groups (DCGs)*

The three-day citizen scientist training workshop was a success in terms of improving their abilities and engaging them in research and project activities. These types of training should be provided for youth in order to inspire stewardship and positive energy to actively engage and work in the conservation field. A Women-led Dolphin Conservation Group (DCG) was established. Each group has 8 members, and each member of the group will be engaged in the different activities of the project based on their interest. To sustain the deliverable of the project, the roles and responsibilities of each member of the citizen scientist is crucial.

*Picture 7: PI demonstrating the procedure of water sampling to the participants of citizen scientist training*


*Picture 8: Demonstrate to use of GPS (Left) and Telescope, binoculars (Right) during the training program*


*Picture 9: Group discussion (Left) and participants from each group present their learning and understanding on the provided topic (Right)*


*Picture 10: Participants (Left) observing the operating mechanism of water quality testing kits and practically using the kits to test the water quality using the kits of Koshi River in the field*

## 4. Conservation Outreach Program (Radio Jingle)

Underpinning many of the threats faced by the River Dolphin is due to lack of knowledge, appreciation, and awareness about the species which further escalates with limited information disseminated and communicated to the public. It is important to assimilate different conservation programs to the targeted communities in the quest to upscale their knowledge and information regarding dolphins and encourage their participation in their conservation. Considering this situation, among the identified conservation outreach tools for the program, from this quarter radio jingle has been broadcasted. Beforehand selecting the radio station, rapport survey with the local people was conducted. Based on their recommendation and considering their outreach to 7 districts, over one million people mostly in eastern and central Nepal; Saptakoshi FM, 90 MHz, Itahari Sunsari was selected. Three different radio jingles were prepared, covering different information regarding River dolphins and related components, and broadcasted through a local radio station.

The radio station has been broadcasting the radio jingles 4 times a day at 8:50 am, 10:45 am, 4:45 pm, and 6:30 pm time schedule from June 8, 2022, continuous to December 8, 2022. The project intends to disseminate the conservation message and important information in this regard to as many people as we can accumulate and encourage them to spread the disseminated message to other people not limiting only to themselves.

## 5. Socio-economic Survey

A socio-economic survey was conducted using the close-ended structured questionnaire primarily focusing on the river-dependent communities. For the survey, a digital platform-the Kobot tool was used, considering the efficiency, and effectiveness of using the application. The survey was conducted in the river-dependent communities of Sunsari and Saptari districts. Along with the 6 communities identified through the initial field survey, additional 9 river-dependent communities were identified through key stakeholders and community consultation. From the 15 river-dependent communities a total of 105 Households were interviewed. The project staff along with capacitated citizen scientists were engaged in the survey. The main aim of engaging them was to provide a platform to practically implement their theoretical knowledge gained from the 3-day citizen scientist training and enhance their skill in this sector as well as generate the manpower that can continuously contribute to the conservation activities even after the completion of the project.

In regard to the questionnaire survey, simple random sampling methodology was followed. The survey was primarily focused on river-dependent communities along with the local residents. The information extracted from this survey can be beneficial in understanding their perspectives towards river dolphins, their knowledge, able to get the baseline information including their socio-economic, cultural and can be helpful in drafting conservation plans. The questionnaire was categorized into 4 different categories: general

information of respondents, socio-economic status, fishing intensity, conservation threats, issues and challenges, and respondent knowledge regarding River Dolphin. Within this periphery, the enumerator asked the questionnaire to the respondent.

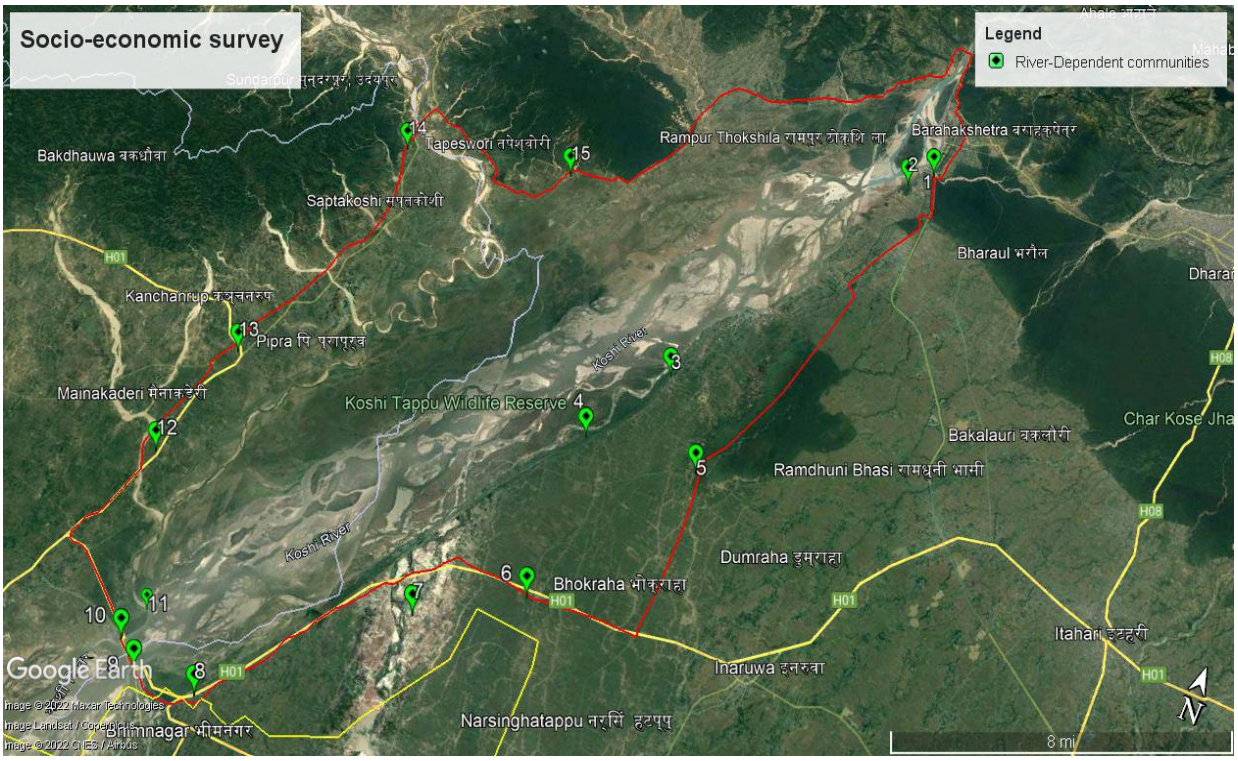


*Figure 1: Socio-economic survey conducted at the river-dependent communities of Sunsari and Saptari district: Illustration from google earth*

*Picture 11: Capacitated citizen scientist taking part in the socio-economic survey in the project site*

*Picture 12: Principal Investigator (PI) at top right and citizen scientists in other two photos during the socio-economic survey at the different locality of river-dependent communities in Koshi River*

## 6. Threat Assessment and Population Survey

Threat assessment and population survey were conducted from Chatara to Prakashpur covering more than 20 km of the upper section of the Koshi River. A team of 10 citizen scientists along with local experts was included in the survey. The main objective of the activities was to understand the prevailing threats along with their impacts on the river ecosystem as well as closely monitor the hotspot areas where the probability of the river dolphin recording was high.

Boat-based survey methodology was followed during the survey, with the active participation of surveyors in this process. As this year's monsoon season started earlier than expected, the water level was above the normal level for this time period. Ahead of the survey, detailed information regarding the methodology, intended goals of the survey, information, and the safety procedure were briefed by the local resource person. Considering the flow intensity of the river, due consideration was given to those individuals who lack the skill to swim, and for the safety concern, life jackets and helmets were provided to them.

*Picture 13: Some glimpses of threat assessment and population survey activities*

Furthermore, the physio-chemical parameter of the water was assessed at an interval of 2 km. A purposive sampling methodology was followed during the water quality assessment. For the physio-chemical parameter, in situ determination, was carried out using multi-meter test kits (WagTech) which include temperature, pH, dissolved oxygen (DO), conductivity, and Total Dissolved Solid (TDS) while for the Nitrate, Phosphate, and Potassium 500 ml of water sample was collected from each sampling site.

**Laboratory analysis**

Water analysis was carried out in the Central Department of Environmental Science (CDES) laboratory at Tribhuvan University. Nitrate and Phosphate analysis was carried out using the following methods:

a. Nitrate – Brucine Method

b. Phosphate – Stannous Chloride Method and
c. Potassium– Photometer

*Picture 14: PI and citizen scientist taking water sampling and accessing physio-chemical parameter of water from Koshi River*

In course of the survey, the considered threats to the aquatic ecosystem and particularly to River Dolphin were recorded, where required information was properly tabulated. Apart from this, for the population survey, previously recorded sites, high potential places like deep pools, and eddy currents were meticulously monitored. Believing the shared information by the local people, since 2008 River Dolphin was not witnessed in the upper section of the Koshi River. Even in our survey, we were unable to track down this species in the upper section. However, a number of prevailing threats hindering the river quality as well as disrupting the aquatic ecosystem were recorded in this survey that possesses

impeccable impacts on the survival of the dolphin. Threats like illegal fishing, collection of flowing timbers, sand dredging, rampant grazing by the domestic animals at the shoreline, etc. were witnessed. Above the listed threats, illegal fishing including the use of electrocution devices and poisoning along with the high intensity of fishing activities further escalate threats to the dolphin. River Dolphin is an apex predator of the freshwater ecosystem and feeds on small fishes, with the reduction in fish species and diversity their existence has always remained susceptible to extinction.

Apart from the above-mentioned threats, the centerline threat for the River Dolphins of the Koshi River is the construction of the Koshi barrage right near the Nepal-India border. This structure has completely prohibited the movement of aquatic animals in between the barrage; where the animals from the upper section could easily move to the downward side of the barrage while the movement against the high current and velocity make it impossible to move against it.

Although two fish ladders existed; one in Saptari and another in the Sunsari district with the aim to provide a safe passage for the free movement of aquatic animals but unfortunately these structures have not been in functioning for many years. Simultaneously none of the country's concerned authorities have previewed its importance at any time. Despite their high importance, both countries lack the interest to bring this structure back to functioning.

*Picture 15: Fish ladder at Koshi barrage; non-functioning at the moment*

*Picture 16: Local people collecting timber from Koshi barrage*

*Picture 17: Fishing at the Koshi barrage*

## 7. Community consultation

Apart from other tools of consultations (focal group discussion, key informant interview); individual and group consultations were also performed during the fieldwork. The main objective of this process is to access as much as information from the local people especially river–dependent communities to have a better understanding and get insightful information regarding the River Dolphin; abundance, distribution range, their perspective regarding

dolphins, underlying threats, issues and challenges, indigenous knowledge and practices to conserve them; if any, etc. Three such consultation meetings have been performed during this quarter of reporting. This platform was not limited to acquiring the information from them only rather the project team also share the important information among them. This approach has a multifaceted benefit as the project team can have access to the essential information that remained within certain groups or communities while the

*Picture 18: Community consultation with local people from Madhuban (Left) and Jabdi (Right)*

Picture 19: *Community consultation with local people from Patharipur of Saptari district*

## 8. Habitat Monitoring

Besides the regular activities of the project, the team as well as citizen scientists when and where needed, monitored the hotspot habitat of dolphins and threats. The main objective of this approach was to document any illicit activities, and prevalence to have negative impacts on river ecosystems and more dolphins. Limiting not only recording the illegal activities, the team also didn't miss any chances to monitor the possibility of the presence of river dolphins in the upper section of the river despite no presence recorded in a decade. Regular

monitoring will be conducted throughout the project tenure and moreover, encouraged the citizen scientist to take initiation in the coming days.

*Picture 20: Regular monitoring at different sites (Upper and lower section) of Koshi River*

## 9. Future plans

Following activities will commence in the next quarter.

1. Socio-economic data analysis.
2. Prepare the threats and hotspot map.
3. Water quality analysis.
4. Print and distribute the brochures and posters.
5. Conduct school and community awareness programs.
6. Installation of the information board.
7. Threat assessment and population survey in the lower section of Koshi barrage