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Population Status of the Indian Softshell Turtle (*Nilssonia gangetica*) in Chitwan, Nepal

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SUMMARY

We conducted this study to determine the population, distribution, and threats of the Indian softshell turtle (*Nilssonia gangetica*) in Chitwan, Nepal, based on a social survey conducted in four sites along the Rapti River in Chitwan, Nepal. The direct survey was conducted in August 2024 and involved 100 respondents selected through simple random sampling, with participation from local ethnic communities, park officials, and conservation stakeholders. The Indian softshell turtle was recognized by 49.2% of respondents. Most turtle encounters occurred near rivers during routine activities such as fishing, wood collection, and grazing. Although 86% of families did not report collecting turtles, children and local individuals were more involved in collection than outsiders. The primary reasons for collection are food and decoration. Major threats identified include habitat loss, pollution, human disturbances, traditional medicinal use, and lack of awareness.

Keywords: Indian softshell turtle, Status, Survey, Threats.

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INTRODUCTION

Approximately 324 species of turtles and tortoises have existed in modern times and are recognized as distinct (Rhodin, 2008). Globally, there are about 300 species of freshwater tortoises and turtles, distributed across seven primary geographical regions. Asia is the most diverse region, with nearly 75% of its species classified as Critically Endangered (CR), Endangered (EN), or Vulnerable (VU), and 91% listed on the IUCN Red List, making it the region with the highest proportion of threatened species (Hashmi and Safi, 2025, Stanford et al., 2020; TCF, 2002; TCC, 2025; TTWG, 2025). In Nepal, a total of 18 species of turtles are reported; most of the turtles are cited by the IUCN Red List of Threatened Species and either in Appendix I or II of CITES. Ten turtle species are reported in Chitwan, and among them, nine are listed in the category of threatened species with five being softshell turtles (Pun et al., 2025; TTWG, 2025). The Indian softshell turtle (*Nilssonia gangetica*) is listed as Endangered by the IUCN Red List of Threatened Species and is in Appendix I of CITES. It has a maximum carapace length of 94 cm and can weigh more than 100 kg; it is omnivorous, subsisting on both aquatic flora

and fauna; it basks extensively on shores and sandbars, often in groups; it rest in shallow water with the snout protruding and lives in rivers but generally tends to avoid temporary water bodies. In Nepal, it is found in the western to eastern regions of the Terai at elevation below 300m (Pun et al., 2025).

Turtle shells are used for both the production of medicine and souvenirs for tourists (Ernst et al., 1997; Altaf et al., 2020). Turtles are killed as pests, and some are accidentally drowned in fishing gear (Whitaker, 2009). Their eggs and hatchlings are preyed upon by monitors, herons, and some small mammalian predators (Kanwal and Khan, 2018). Illegal fishing, washing of clothes and dishes, bathing, and habitat destruction are factors influencing anthropogenic disturbance of the species (Safi and Khan, 2014; Khadka and Lamichhane, 2020; Ara et al., 2022; Pun et al., 2023).

Effective managemet and appropriate engagement with herpetofauna in the field depend on natural habitat management and precise information on geographical distribution. Natural ecosystems are undergoing significant, previously unheard-of changes due to human activity. Different ethical perspectives on nature and wild species have emerged as a result of humans' position as agents of negative change (Safi et al., 2025a, b). The wetland environment is essential to the natural world's ecological balance. Although the significance of wetlands and their function in ecosystem management have been extensively researched, there are numerous environmental risks that either directly or indirectly impact the health of wetlands. Both manufactured and natural hazards are affected by human activity (Khan et al., 2017; Safi and Hashmi, 2021).

Turtle populations may decline due to habitat fragmentation caused by highways, drainage ditches, agricultural areas, housing, and exotic species (Safi et al., 2020, 2024a, b). The impact we may have on populations and environments that go beyond our scientific study of creatures must also be taken into account in field biology, particularly herpetology. For ecologists and environmental researchers, the majority of researchers believe that the design of their studies, choices, and concepts can be particularly frustrating, short-term, and frequently troublesome (Curzer et al., 2013a, b; Safi et al., 2025a, b).

The Indian Softshell Turtle is a species of freshwater turtle that inhabits Nepal's river habitats, especially the marshes and rivers of Chitwan. However, its natural populations have decreased due to increased human-induced stresses, such as habitat degradation, water contamination, illegal hunting, overuse, sand mining, and disturbances from human activities. There is a dearth of scientific information regarding the population status, distribution, habitat usage, and threats to this species in Chitwan, despite the fact that conservation is vital. The current study sought to determine the distribution and population status of the Indian Softshell Turtle in Chitwan, Nepal, identify major threats to its survival, evaluate habitat conditions, and provide baseline information for developing conservation and management plans that will ensure the long-term survival of this endangered species of freshwater turtle.

MATERIALS AND METHODS

STUDY AREA

Chitwan, located in Bagmati Province span an area of 2,238.39 km² (27°35'N 84°35'E) and has an elevation ranging from 141 to 1947 meters (Figure 1). The temperature fluctuates between 8°C and 37°C. As of the 2011 census, the population was 579,984,

comprising 279,087 males and 300,897 females with diverse ethnic groups including Brahmin, Chepang, Darai, Gurung, Magars, Tamang, Tharu, etc (National Population and Housing Census, 2011). The region is divided into seven administrative areas: Bharatpur Metropolitan City, Kalika Municipality, Khairahani Municipality, Madi Municipality, Ratnanagar Municipality, Rapti Municipality, and Ichchhakamana Rural Municipality. Chitwan National Park (CNP) covers 952.63 km^2 and has an elevation range 100 to 815 meters. The Buffer Zone (BZ) extends over 729.37 km^2 situated between 27°28' to 27°70'N and 83°83' to 84°77'E. Park management and the Buffer Zone are organized into four administrative sectors: Eastern (Sauraha), Northern (Kasara), Southern (Madi), and Western (Amaltari) (DNPWC, 2019). The park is bordered by the Narayani River. Operations will take place in four locations- Lothar, Saurah, Kasara, and Meghauli where local communities reside near to the habitats of the Indian softshell turtle (Figure 2).

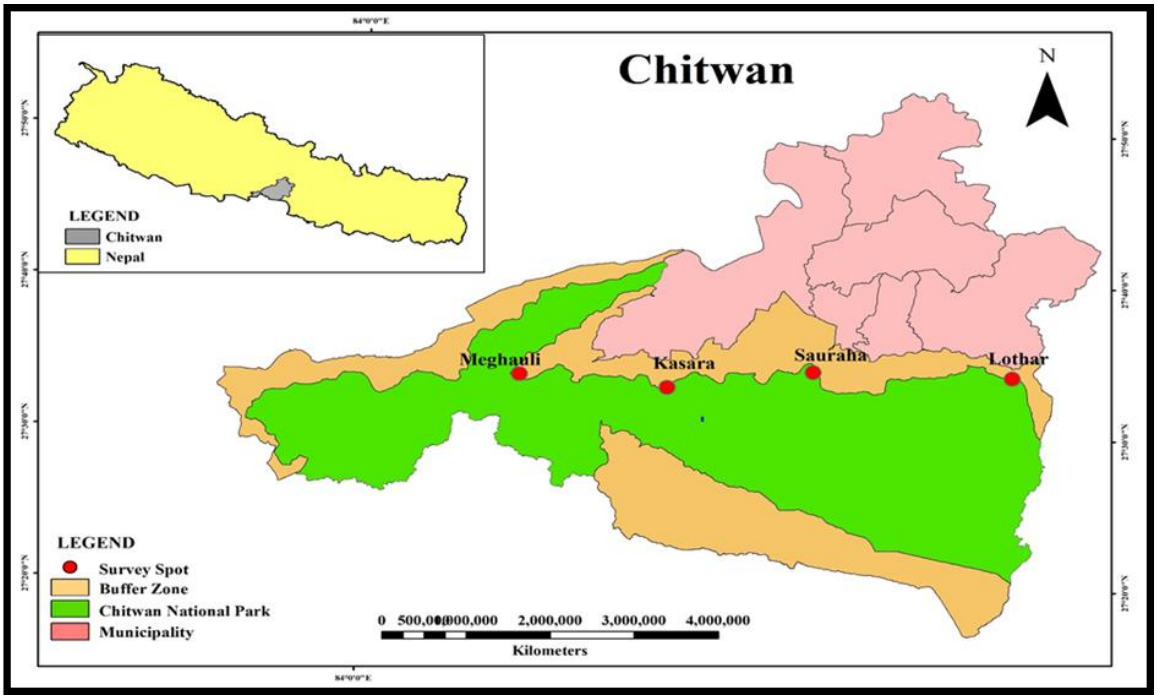

Figure 1: Map of study areas.

DATA COLLECTION AND DATA ANALYSIS

The work was done in August 2024 (6 days, between 11:00 am and 06:00 pm) with four teams consisting of four members each. Based on consultations with the village authority, and to enhance community involvement in the evaluation, it was designed in such a way that local knowledge and attitudes about species' history, present status, and future conservation objectives would be reflected. The simple random sampling technique was followed to select individuals for interviews and questionnaires, with 100 individuals (4 spots x 25 individuals = 100 people). The questionnaire was divided into three sections: (i) Personal and household information, such as age, sex, head of household, family members, and observations; (ii) Species composition, population, distribution and ecology; (iii) Local knowledge, hunting, trade and other threats. The questions were arranged in English, and team members verbally asked them in Nepali translation to

ensure that purpose of the questionnaires was understood properly. The surveys were carried out by both female and male members to reduce potential gender biases. The target respondents were primarily local ethnic groups who compete with species to earn their living through the fishing. This section also involves key informants such as village leaders, park officials, buffer zone community members, and staff from the Gharial Conservation Breeding Center. A camera (Canon Powershot SX 540 HS, Sony α A6400) was used to capture photographs of the activities and the coordinates were noted using by GPS Etrex 10. The map was produced using ArcGIS 10.8.

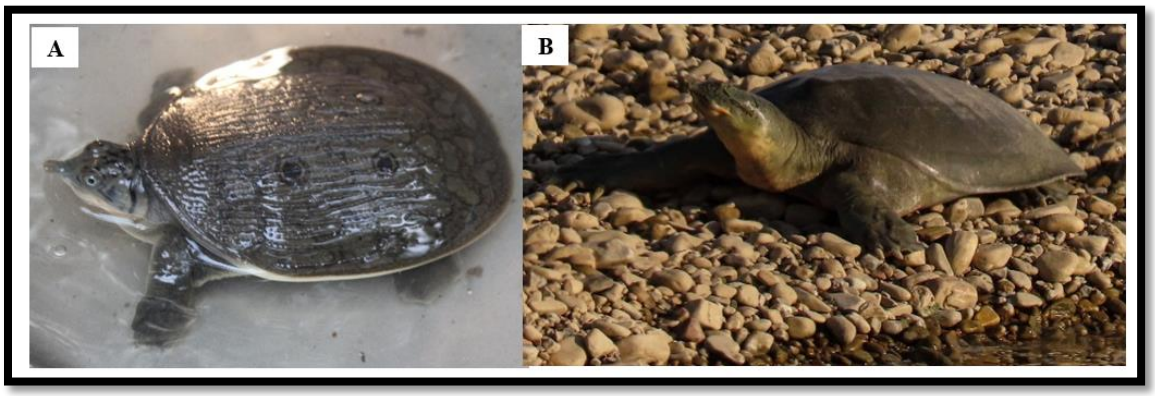

Figure 2: Indian Softshell Turtle (*Nilssonia gangetica*) in Chitwan National Park: A- Juvenile and B- Adult.

RESULTS

The study selected four sites in the study area: Lothar, Saurah, Kasara, and Meghauli, which are lined by the Rapti River (Figure 3). The simple random technique was used to select individuals for the interview and questionnaire. The survey involved different varieties of people including fishermen, park officials, buffer zone community members, and Gharial Conservation Breeding Center staff. The survey was conducted in four sites with 100 individuals, assisted by four teams, each consisting of four members.

The survey was completed by 100 individuals in four different locations; most of the spots had only one respondent, while some spots had more than one. A total of 67 spots were covered (22 in Lothar, 10 in Sauraha, 14 in Kasara and 21 in Meghauli) in the study area (Figure 3). The heads of households and male respondents outnumbered female respondents, such cases leading to gender bias in the dataset could be avoided with the sampling design. Respondents' age ranged from 20 to over 40. Eighty-three percent of respondents were married and had approximately five family members, most of whom came from poor and medium living standards.

Seventeen turtle species were identified out of 18 recorded species in Nepal, with locals identifying the following species; 11 species in Lothar, 15 species in Sauraha, 3 species in Kasara and 12 species in Meghauli (Figure 4). The Indian softshell turtle was observed in 49.2% of cases (Figure 5); most respondents found the species in jungle, river, and forest habitats during the nesting season (rainy, summer, and winter).

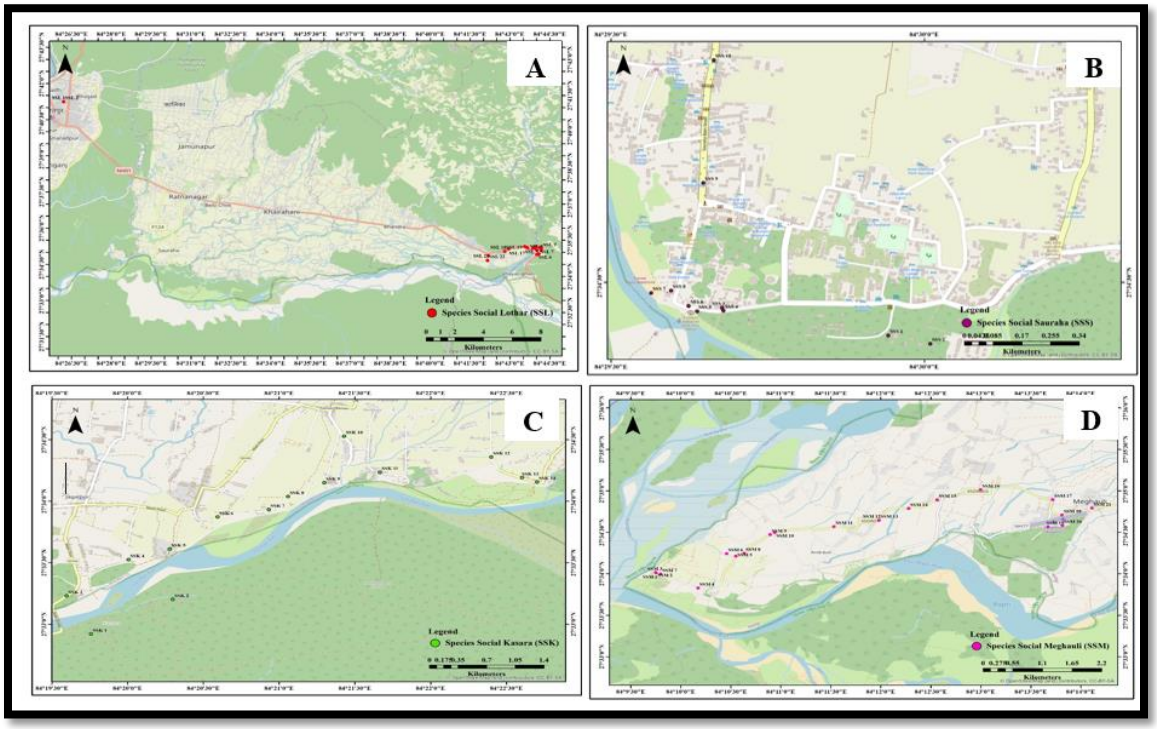

Figure 3: Map showing the social survey: A- Lothar, B- Sauraha, C. Kasara, D. Meghauli.

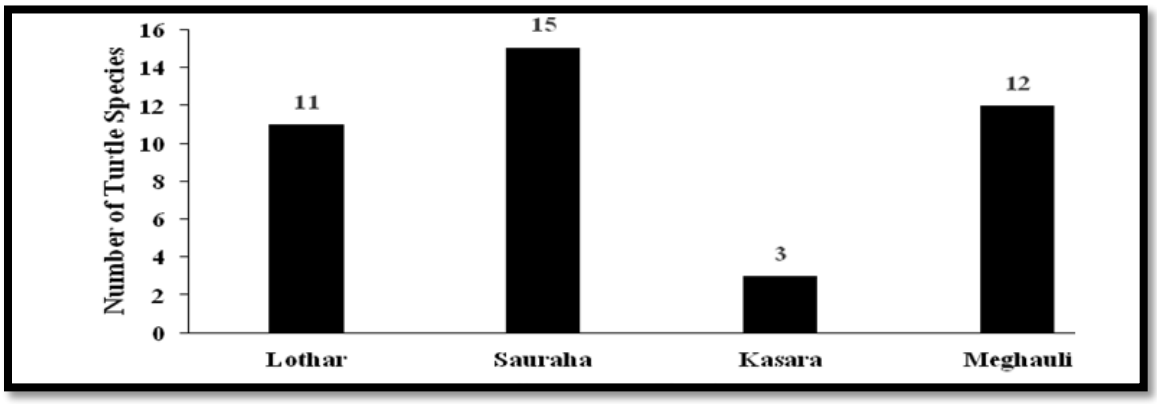

Figure 4: Turtle Species know by Local in the different Location.

Families did not collect the Indian softshell turtle (86%, Figure 6), and most collectors were children. More locals collected the species while engaging in secondary activities (93%) such as jungle visits, grass cutting, wood collection and fishing; if collected, the turtles were used for food. Locals primarily collected adult species (Figure 7). Turtle catches occurred through the use of hook and line (38%), nets (15%), and other methods (45%), with traps being utilized. Locals were active in these activities during the rainy season and winter. Locals collected the species more than outsiders (Figure 8), using them for food and decoration. Eighty-seven percent of villagers did not sell turtles (Figure 9), while the traders purchased live turtles (88%) and juveniles. According to respondents, the reasons behind the increased threats to the Indian soft-shell turtle

include a lack of knowledge, pollution, traditional medicine, human activity, and habitat loss.

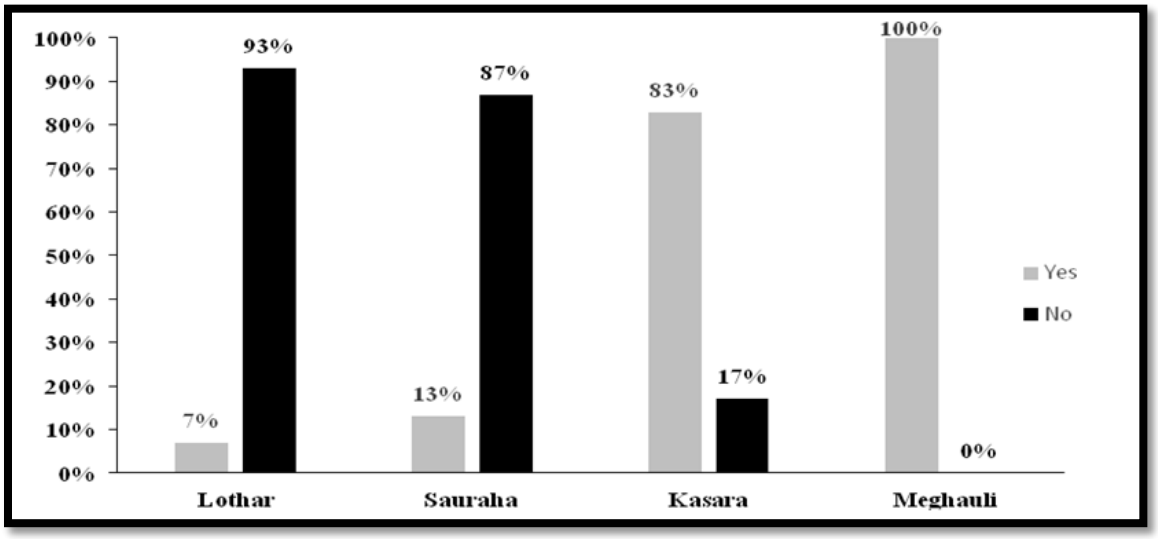

Figure 5: Indian soft-shell Turtle Seen by local.

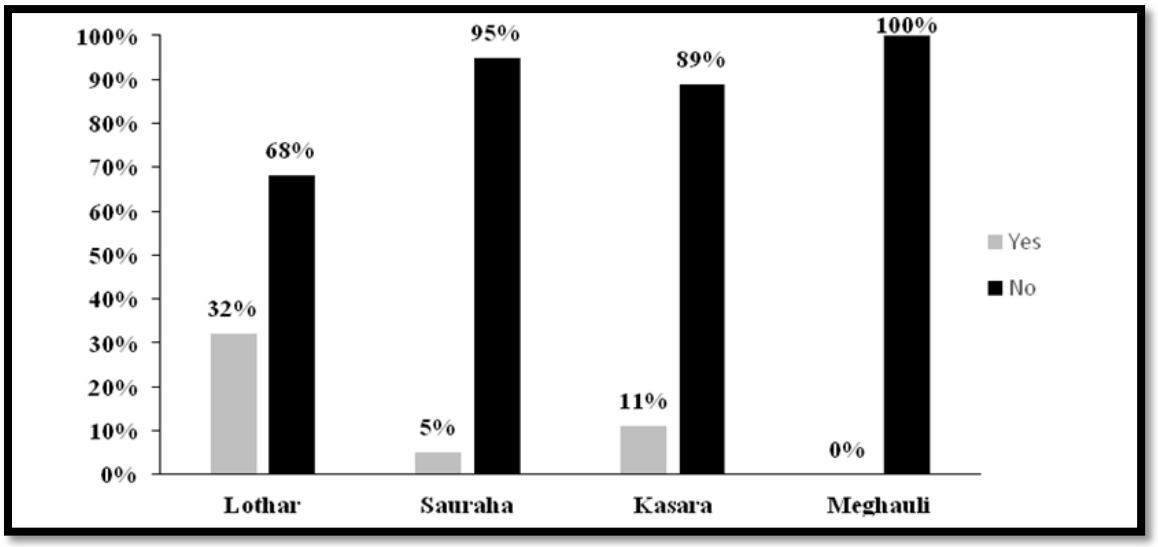

Figure 6: Family Collect Indian soft-shell Turtle.

THREATS

According to the survey, the work recorded five major threats to the species such as habitat loss, pollution, human disturbances, traditional medicinal use, and lack of awareness.

DISCUSSION

In this survey, we gathered information on the Indian soft-shell turtle (*Nilssonia gangetica*) from locals in Chitwan, whereas there were no such data on the species using a social survey. The findings of this survey are significant for understanding the status of

the species in the study area, which will help to design future survey strategies and conservation initiatives. The results confirm the presence of *N. gangetica* and its abundance compared to other turtles at the study sites, as recorded by Khadka and Lamichhane (2020) and Pun et al. (2023).

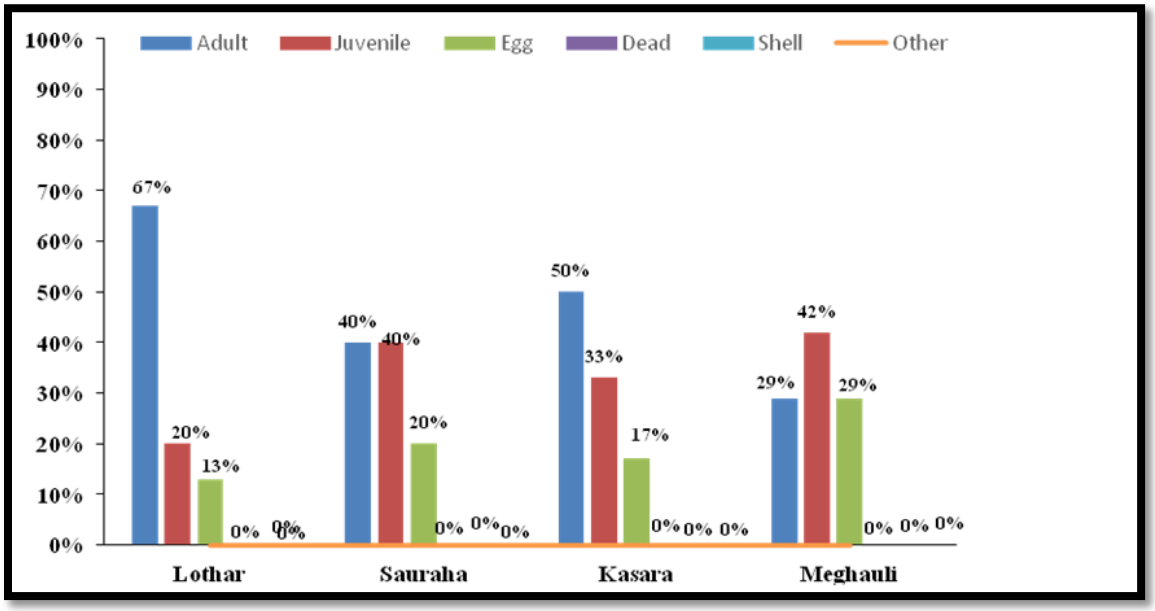

Figure 7: Indian soft-shell Turtle collect most.

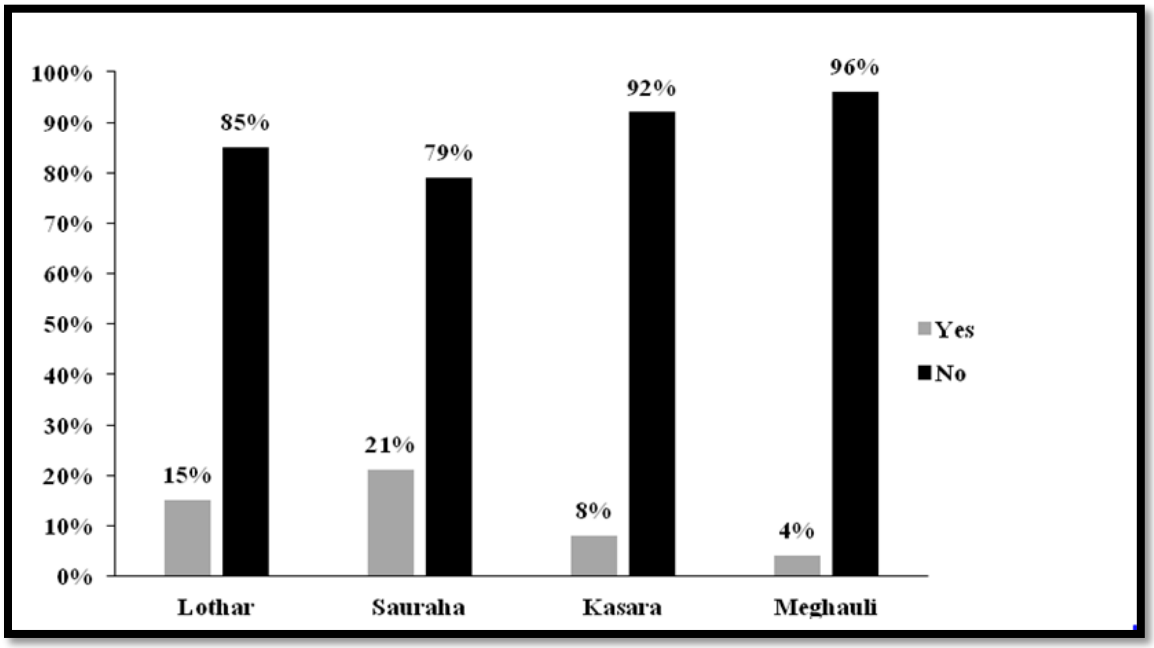

Figure 8: Indian soft-shell Turtle collected respondents by outsider.

According to respondents, the species was found in jungle, river, and forest habitats. The study found that the heads of households and male respondents were more frequent than female participants in the 20 to over 40 age range; their status was poor to

medium, which indicating they had knowledge about the status of the species in the area. In the study area, adult *N. gangetica* were mostly collected by local children, who went to the riverside for secondary activities using various techniques, though traps were used very rarely (Safi and Khan, 2014; Kästle and Schleich, 2016). The species were collected for food and decoration, mentioned by others (Kästle et al., 2013; Pun et al., 2025). The increased threats to the Indian softshell turtle identified in this study were lack of knowledge, pollution, traditional medicine, hunting, and habitat loss (Kästle et al., 2013; Safi and Khan, 2014; Pun et al., 2025).

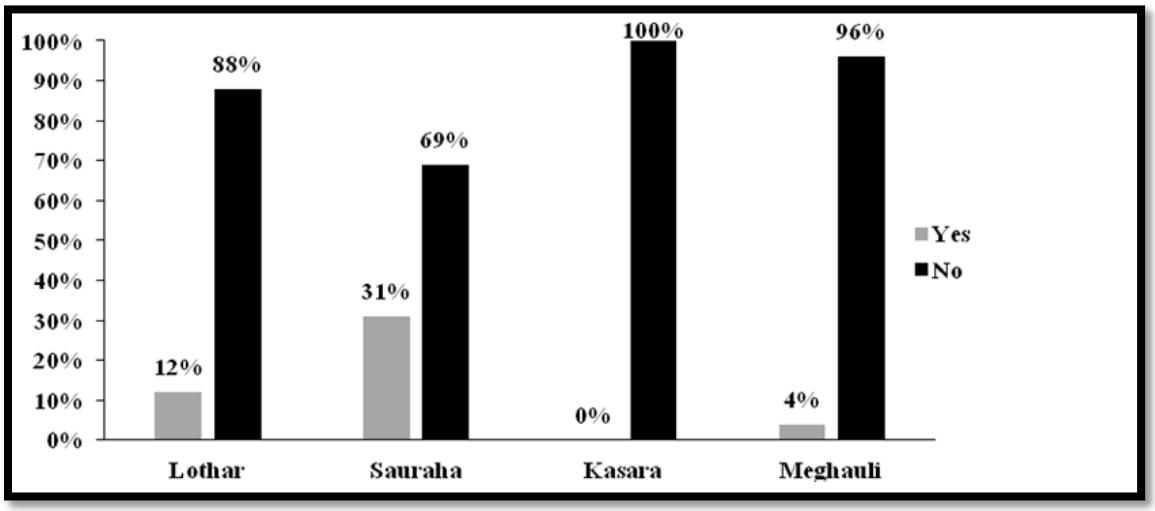

Figure 9: Indian soft-shell Turtle sell by Villager.

Freshwater turtles are opportunistic scavengers that also consume live prey, making them vulnerable to being caught on baited fishing hooks. Some hooks can become lodged in the mouth of the turtle, making feeding difficult. Other hooks may be swallowed and become lodged in the throat or even the stomach, which can be fatal (Safi et al., 2020; Safi and Hashmi, 2021). Environmental and climate changes, as well as natural disasters, are also major threats to turtle survival. Pollution, contamination of water with industrial, agricultural, or domestic waste, pesticide sprays, fertilizers, global warming, and pathogens all pose threats to the existence of freshwater turtles. Habitat modification, degradation, and destruction are also important factors contributing to their decline (Khan et al., 2016a, b).

CONCLUSION

The primary objective of this study is to provide recent and updated information about the population status and conservation of the Indian softshell turtle (*Nilssonia gangetica*) from locals in Chitwan, Nepal. The social survey across four sites along the Rapti River revealed that local communities are aware of the Indian soft-shell turtle, with 49.2% of respondents able to identify the species. Most turtle-related activities occur near rivers for purposes such as fishing, wood collection, or grass cutting. Although 86% of families reported not actively collecting turtles, children and local individuals were more involved than outsiders, mainly for food or as pets. Major threats identified by respondents include lack of awareness, habitat loss, pollution, traditional use, and human disturbances. These

findings underline the need for community education, stricter protection measures, and sustainable coexistence strategies for turtle conservation in the area.

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