A Study on Crocodile Behavior (*Crocodylus palustris*) and Public Value Orientation in Ethimale of Monaragala District

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Introduction

Mugger crocodile (*Crocodylus palustris*) is principally restricted to Indian subcontinent and the highest number is recorded in Sri Lanka (Da Silva and Lenin, 2010). *Crocodylus palustris* is categorized as a vulnerable species in IUCN red list (2011). Furthermore, due to destruction of their natural habitats, illegal hunting, fishing activities and crocodile attacks during sand mining, bathing and washing, there is an emergence of this interaction as a human-crocodile conflict. Though the existence of considerable number of *C. palustris* is recorded in Uva less literature is available on their status in Uva Province of Sri Lanka. Therefore, this study was conducted to understand people's attitudes, risks, believes and practices towards human crocodile conflict and to study the behavior of crocodile in Ethimale area.

Methodology

The study was conducted in villages surrounding eight perennial and seasonal tanks (Doser tank, Wattarama tank, Kotiyagala tank, Heekaduwa tank 1 and 2, Karadandara tank, Karakolagaswewa tank and Vila oya) at Ethimale of Monaragala district from May to August 2014. Ninety four individuals were interviewed using a pre-tested structured questionnaire including farmers, fishermen and villagers to determine their awareness, knowledge, practices, believes and attitudes regarding *C. palustris*. The information on purpose, frequency and duration of water body usage by the villages, crocodile population, their approximate size, migration and their availability throughout the year in the area was gathered through the questionnaire. Moreover, the practices of the people and attitudes regarding crocodiles were identified by gathering information on crocodile attacks, financial damages, people's reaction when seen crocodiles, offending actions, benefits/uses of crocodiles and threats face by crocodiles. Presence of fecal pellets, footprints, smashed vegetation and cleared basking areas were observed to study the migration and basking behavior. Data analysis was carried out by Microsoft Excel and map was created using ArcGIS software including crocodile migration paths.

Results and Discussion

Awareness of the people

The main water sources of Ethimale were tanks and Vila oya. Therefore, around 97% of the respondents used tanks for their needs daily. Moreover, most of households are by or close to the tanks which explains their close relation with the crocodiles.

Knowledge of the people regarding crocodiles

Sixty eight percent of the respondents considered that crocodiles were useful and 32% of respondents believed that crocodiles were not useful or did not know the ecological roles played by the crocodiles. According to them, consumption of crocodile meat and egg are the major uses. Around 53% of the respondents have eaten crocodile meat while 5.3% have consumed crocodile eggs. Though few had heard the uses of crocodile hide they have not done any hide processing.

Though the respondents have seen crocodiles throughout the day, crocodiles were common on tank sides especially in the morning (6.00 to 8.00 a.m.) and evening (5.30 to 7.00 p.m.). Based on the observations of the respondents, highest crocodile number was reported from Kotiyagala tank (20 to 25), followed by Heekaduwa tank-1 (15 to 20) and Heekaduwa tank-2 (10 to 15). Regarding the approximate length of the largest crocodile seen by the respondents, majority (62%) of has seen largest crocodile in between 2-3 m in length.

Nesting season, i.e., from June to August of *Crocodylus palustris* coincides with the dry season in Monaragala (June to September) (Department of meteorology statistics, 2014). Therefore, the hatching of eggs takes place with the beginning of the rainy season. Around 45% of the respondents have seen crocodile nesting sites at tank bunds, Vila oya sides, canal sides, Vila oya anicut and jungle area which close to tanks.However, 11% of respondents have seen Water Monitors (*Varanus salvator*) and Land Monitor (*Varanus bengalensis*) as main predators of crocodile eggs.

Among the crocodile deaths observed by the respondents, most of the recorded crocodile deaths were due to human actions such as shooting and hitting when the crocodiles attack to the fishing nets (Specially for hatchlings). Two crocodile attacks to the fishermen while fishing were reported. However, 37% of the respondents have faced some financial damages from the crocodiles as damage to livestock (especially to calves) (37%), loss of fish yield (29%), fish net damage and damage to pet animals. Among them damage to livestock and damage to net and loss of fish yield were common. Moreover, threat from crocodiles was reported as one reason to refrain youngsters from fishery.

Attitudes regarding crocodiles

Though 77% of the respondents have agreed that the crocodiles have become threat to fishery or daily uses of the water body, 73% of the respondents still believe that conservation programs for crocodiles are essential, since they believe that the number of crocodiles are depleting annually. Moreover, they have suggested translocation of crocodiles (to large tanks, national parks and zoo) and ecotourism to minimize the human crocodile conflict may be due to the ethical reasons since all the respondents are Buddhists.

Crocodile migration and basking behavior

Crocodiles were migrated during the dry season and they were returned to their original habitats at the beginning of the rainy season. Therefore, crocodile migration was highest during August where all most all the seasonal tanks were dried and low water level was observed in perennial tanks. With the beginning of rainy season in September, crocodiles were returned to their original habitats.

Crocodiles were basked commonly during 6.00 am to 9.30 am under direct sun light (average 33°C daily temperature) in open areas such as dead trees in water, on the Vila oya river bank, tank sides/bund and surrounding rocks. With the high day time temperature, they were moved to the tank bottom and come to the top only for breathing meanwhile some crocodiles were moved to burrows.

Recommendations to solve human crocodile conflict and conservation

To minimize human-crocodile conflict conducting awareness program to villagers including conservation and laws related, installation and maintenance of crocodile excluding areas at bathing places, installing warning sign boards and translocation of crocodiles which trap to fish nets can be done. The crocodile conservation can be done to some extent by sharing conservation and management responsibility among local community. The crocodiles can be an attraction of visitors and create employment opportunities for the local community. Eco-tourism may be a good solution for involving people with their traditional knowledge about crocodile conservation and will be helpful to uplift the local socio-economic conditions. Other than eco-tourism, protection of nesting habitats, initiation of crocodile parks or sanctuary, conservation education and public awareness also can be practiced.

Conclusion

Majority of the villagers have sound knowledge regarding crocodile population, behavior, migration patterns and availability. Since almost all the people were engaged with the tanks for their daily needs and majority was farmers and fishermen. Though there are several livestock attacks and economic losses from crocodiles no fatal attacks recorded to people. Therefore, majority of the people in Ethimale was having a positive attitudes regarding conservation of crocodiles.

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