

**Local Perception, Values, and Conservation
Attitude towards Brahminy Kites
(*Haliastur indus* Boddaert, 1783)
in Tugbok District, Davao City, Philippines**

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ABSTRACT

Brahminy Kite (*Haliastur indus* Boddaert, 1783), locally known as *Banog*, is a diurnal raptor extant in the Philippines. This species is an essential bioindicator of ecological health. However, due to human persecution and habitat loss, there is a rapid population decline in the Philippines. Interestingly, *H. indus* has been observed in a suburban town in Los Amigos, Tugbok District, Davao City, perching on trees alongside the Davao to Bukidnon national road. This study aims to determine the influence of human perception and values towards the conservation of *H. indus* through multiple linear regression. Seventy (70) households were interviewed on their perception, values, and conservation attitude. It was found that *H. indus* is considered a pest to aquaculture because it feeds on the fingerlings of Hito (*Siluriformes* sp.) and Tilapia (*Oreochromis* sp.). However, locals still support conservation due to existing laws. This result highlights the importance of laws in deterring criminal offenses against wildlife. There is a need to strengthen law enforcement and develop a conservation education program to foster positive perception, values, and conservation attitude. These are efficient and sustainable approaches to accomplish conservation goals.

Keywords: *Haliastur indus*, ecological knowledge, perception, values, conservation attitude, Philippines

INTRODUCTION

Brahminy Kites (*Haliastur indus* Boddaert, 1783), locally known as “Banog” for their kite-like flight pattern, are middle-sized birds of prey distributed around Southeast Asia and in other parts of the world. They thrive in environments like shorelines, riversides, mountains, forests, urban and suburban areas. Their primary diet includes carrions, insects, and fishes (BirdLife International, 2016; Sivakumar & Jayabalan, 2004).

The birds of prey are well-studied because of their high ecological importance. They are considered sensitive bioindicators of environmental changes or habitat quality (Padoa-Schioppa et al., 2006; Rodriguez-Estrella et al., 2008). The shifting of *H. indus* to urban habitats could indicate high predation pressure (Roshnath et al., 2019). Meanwhile, *H. indus* is also culturally significant as they are regarded as the official mascot of Jakarta, Indonesia (Debus et al., 2020; Jakarta, 2015).

H. indus is categorized as a least concern species under the International

Union for Conservation of Nature (IUCN) List of Threatened Species (BirdLife International, 2016). However, there is a rapid decline in its population due to hunting, pesticide use, limited food availability, and human persecution in Southeast Asia (Ferguson-Lees & Christie, 2001). While the tropical rainforests serve as the home to 64% of birds of prey in the Philippines, extensive deforestation and habitat fragmentation pose a threat to these species (Khaleghizadeh et al., 2014).

There have been numerous conservation efforts in the past. However, there are drawbacks to their implementation and sustainability. Conservation efforts are challenged due to a lack of support systems from the locals, confirming that the human attitude towards wildlife conservation significantly affects wildlife conservation. Understanding the factors that influence their attitude is necessary for designing programs to lessen human-wildlife conflict (Mir et al., 2015). Sustainable preservation of species is often grounded on human perception, values, and conservation attitudes (Ceriaco, 2012).

There is an observed population of *H. indus* in a suburban town in Brgy. Los Amigos, Tugbok District, Davao City. Their suspected roosting and nesting sites are located alongside the Davao to Bukidnon national road. This study investigates the local ecological knowledge, perceptions, values, and conservation attitude towards *H. indus* as species conservation variables.

OBJECTIVES OF THE STUDY

This study aimed to determine the local ecological knowledge and the levels of perception, values, and conservation attitudes of the residents in Barangay Los Amigos, Tugbok District, Davao City, towards *H. indus*. This study also aimed to determine the significant influence of perception and values towards conservation attitude.

MATERIALS AND METHODS

Research Design

This study employs both descriptive and correlational quantitative research designs. The respondents were interviewed about their local ecological knowledge towards *H. indus*, while the levels of their perception, values, and conservation attitude were correlated.

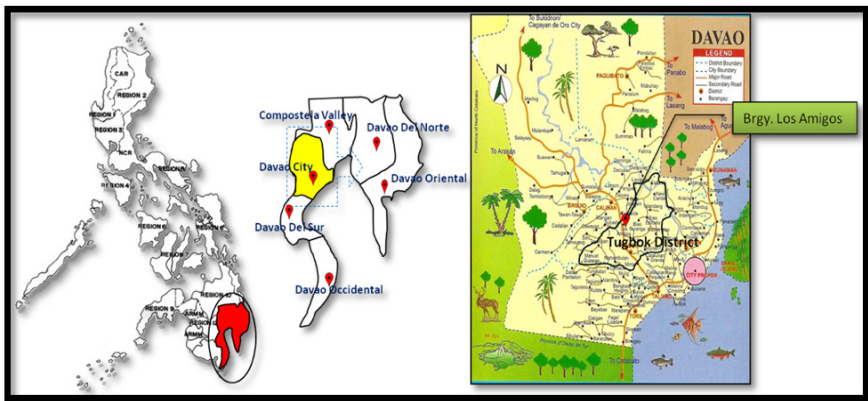


Figure 1. Coordinates Map of the Locale of the Study in Barangay Los Amigos, Tugbok District, Davao City.

The Locale of the Study

This study was conducted in Barangay Los Amigos, Tugbok District, Davao City, Davao del Sur (7.1405° N, 125.4755° E) from April to May 2017. The suspected roosting sites of *H. indus* were very close to the Davao to Bukidnon national road traversing the Talomo river.

Respondents

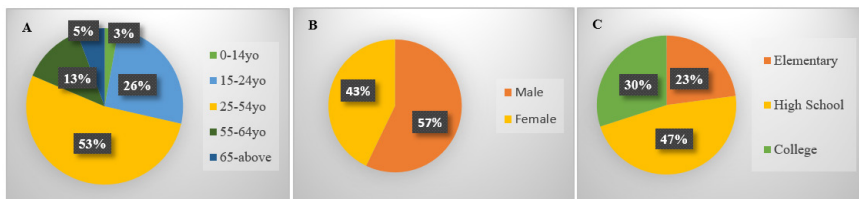


Figure 2. Socio-Demographic Profile of the Respondents in Barangay Los Amigos, Tugbok District, Davao City in terms of (A) age, (B) sex, and (C) education.

In this study, the researchers interviewed 70 respondents who reside near the suspected roosting sites of *H. indus*. The majority of the respondents belong to the 25 to 54 age group (53%), followed by the 15 to 24 age group (26%), 55 to 64 (13%), 65 and above (5%), and 0 to 14 (3%). In terms of sex, the respondents are composed of more males (57%) than females (43%). Most of the respondents are at least high school level or graduate (47%), then college level or graduate

(30%), and lastly, elementary level or graduate (23%). Overall, the number of respondents represents 0.72% of the total population of Barangay Los Amigos, identified through quota (N=70) and purposive sampling techniques. Only those whose residence is close to the suspected roosting sites and who have awareness about *H. indus* were qualified to become respondents of the survey.

Data Collection

A research instrument adapted from Ceriaco (2012) was used to gather data relevant to this study. The researchers employed face-to-face interviews noting the respondents' local ecological knowledge and their levels of perception, values, and conservation attitude through a 5-point Likert Scale (1 = strongly disagree, and 5 = strongly agree). Each interview lasted for an average of 25 minutes. The data were then consolidated for descriptive and correlational analyses.

Statistical Tools

The researchers utilized a weighted mean to determine the levels of perception, values, and conservation attitude towards *H. indus*. Simultaneously, the Pearson product-moment of correlation was used to determine the significant relationship between the three variables. Lastly, the multiple linear regression was used to determine the significant influence of perception and values towards the conservation attitude.

RESULTS AND DISCUSSION



Figure 3. Brahminy Kite (*Haliastur indus*) foraging on a tree in Barangay Los Amigos, Tugbok District, Davao City. The photo was taken by Arabejo (2020).

The respondents described *H. indus* as a large bird, slightly smaller than the Philippine Eagle (*Pithecophaga jefferyi*), and larger than the Crow (*Corvus spp.*). Its body color is dominated by brown with white-colored breast and face. Often observed in flight, the raptor is distinctively characterized to have broad wings and sharp eyes and as an inspiration of strength and agility to the community. *H. indus* is commonly observed flying and perching on trees near the river. Their fast movement and high altitude flight behaviors show that they are consistently hunting for available prey.

Table 1

Levels of perception, values, and conservation attitude towards Brahminy Kites (Haliastur indus)

Variable	Mean (x)
Perception	2.95
are dangerous animals	3.70
are not useful to humans	2.10
are poisonous	3.10
are fatal to human beings	3.40
usually attack humans	3.50
are not important to the ecosystem	1.90
Values	2.61
I do not like the animal	2.20
I find the animal ugly	2.00
I don't go near places where the animal is	2.70
If the animal is present, I move slowly and quietly in order to not be noticed	2.90
I don't like the noises that the animal makes	3.00
I fear the animal	3.10
The animal gives me nightmares	3.00
I don't like if the animal lives in my house or property	2.80
I think that the presence of the animal does not give value to the surrounding environment	1.80

Table 1 continued.

Variable	Mean (x)
Conservation Attitude	2.36
When I find one of these animals, I usually kill it or ask someone to kill it	1.60
If there was a population of these animals in my property, I would take measures to eliminate it	2.20
I do not think there should be a greater concern for the preservation of these animals	2.70
I think that these animals should be exterminated	3.00

Based on the survey, the respondents demonstrated a moderately negative perception ($x=2.95$), moderately negative values ($x=2.61$), and moderately positive conservation attitude ($x=2.36$) towards *H. indus*. While the primary source of livelihood in the community is aquaculture, particularly Hito (*Siluriformes* spp.) and Tilapia (*Oreochromis* spp.) production, the moderately negative perception and values are based on the reports that *H. indus* feeds on the fingerlings of the cultured species. Consequently, *H. indus* is labeled as a domestic pest, reducing the aquaculture industry's revenue and profit. As an adaptive measure, the property owners often install strings that trigger auditory cues to repel and discourage *H. indus* from feeding on the cultured species. Reidinger and Miller (2013) have also documented this mechanism as a standard method in wildlife damage management. Further, the respondents also reported that *H. indus* preys on poultry species, particularly the hatchlings of domesticated chicken (*Gallus gallus domesticus*) and ducks (*Anas platyrhynchos*).

Despite the moderately negative perception and values, the respondents showed a moderately positive conservation attitude towards *H. indus*. Some misconstrued *H. indus* as the Philippine Eagle (*Pithecophaga jefferyi*) with installed tracking devices closely monitored by the government. This misconception prohibits them from persecuting the species as they are afraid of the legal consequences and punishments. Meanwhile, some were also aware of wildlife conservation laws, which subsequently influence their conservation attitude. Human participation and commitment in conservation programs, projects, and activities are often grounded on awareness and knowledge about conservation laws (De Klemm & Shine, 1993; Somchai, Adisak & Paitool, 2015). Laws, therefore, play an integral role in the conservation of wildlife, particularly *H. indus*.

Other factors that contribute to the respondents' moderately positive

conservation attitude include the perceived ecological value of the species. *H. indus* is an indicator of ecological integrity and habitat quality (Roshnath et al., 2019). The respondents perceive that the abundance of *H. indus* in their community means a healthy environment. *H. indus* feeds on other domestic pests such as the non-native rodents (*Rattus* spp.) and cane toads (*Rhinella marina*). The pest rodents are known to infest various agroecosystems in the Philippines (Ong & Rickart, 2008). On the other hand, cane toads are better than *H. indus* in consuming the aquaculture industry's fingerlings. When asked to rank the pest species in aquaculture, the respondents suggest that cane toads are the most dominant, followed by Kingfisher (*Alcedines* spp.), then *H. indus*. The vulnerability of wildlife species against cane toad infestation is due to habitat overlap and lack of resistance against bufotoxins (Shine, 2010). The explosion of the population of these domestic pests poses threats to the community's environmental and economic integrity. Hence, predation by *H. indus* is a significant balance checker, regulating the population of other pest species.

The respondents also claimed that *H. indus* mainly consumes sick fingerlings that float and swim near the water surface. Consequently, this curbs disease transmission among healthy fingerlings. Some locals are even grateful for the abundance of *H. indus* near the fish ponds. They are known to be vertebrate scavengers, consuming sick and fish carrions (Schlacher et al., 2013a, 2013b). Their diet also includes freshwater paddy field crabs (*Paratelpusa* sp.) and freshwater fishes (Sivakumar & Jayabalan, 2004). The diet behavior of *H. indus* offers the aquaculture industry a type of biological control.

Lastly, a dressed chicken company situated in the community reportedly disposes of biological wastes such as offal and entrails to the river. These are consumed by *H. indus*, proving their scavenging diet behavior. However, this diet poses health risks to *H. indus* due to high estrogen levels in the said biological wastes. High estrogen diets have various effects on the growth, development, and behavior of wildlife as initially observed in song sparrow (*Melospiza melodia*) and gulls (*Larus* spp.) (Leszczynski et al., 1985; Trukhina et al., 2014; Heimovics, Trainor & Soma, 2015; & Fry, 1995). There is a need to investigate the physiological effects of biological wastes consumption, particularly in *H. indus*.

Table 2

*Pearson correlation of perception, values, and conservation attitude towards Brahminy Kite (*Haliastur indus*)*

Variables	Pearson Correlation	Sig. (2-tailed)
Perception and Values	0.09	0.45
Perception and Conservation Attitude	0.20	0.09
Values and Conservation Attitude	-0.20	0.08
Legend:	± 0.00 no linear relationship ± 0.30 weak linear relationship ± 0.50 moderate linear relationship ± 0.70 strong linear relationship ± 1.00 perfect linear relationship	(+) values – direct relationship (-) values – inverse relationship

Perception, values, and conservation attitude showed a weak linear relationship in the Pearson correlation test. The Pearson correlation indicates the linear relationship among variables and the specific degrees thereof. However, this does not necessarily imply that one variable causes the other and does not distinguish between the independent and dependent variables. Interestingly, the data shows an inverse relationship between values and conservation attitudes (Pearson = -0.20). An inverse relationship entails that as values tend to be more negative, a conservative attitude becomes positive. The respondents have moderately negative values towards *H. indus* due to domestic pestering in the aquaculture industry. However, conservation attitude remains moderately positive due to existing government laws and regulations that prohibit maltreatment and persecution of *H. indus*.

Based on the survey, it was found that there is no significant relationship between perception and values ($p=0.45$), perception and conservation attitude ($p=0.09$), and values and conservation attitude ($p=0.08$). This result indicates that one variable does not have a significant relationship with another variable.

Table 3

*Multiple linear regression model on perception, values, and conservation attitude towards Brahminy Kites (*Haliastur indus*)*

Model	B	Sig.
(constant)	2.34	0.00
Perception	0.21	0.06
Values	-0.23	0.05

The researchers determined the significant influence of perception and values as the independent variables towards conservation attitude as the dependent variable. An R-value of 0.30 was obtained, which shows a weak linear regression model among the variables. Perception and values on *H. indus*, when combined, do not have a significant influence on the conservation attitude of the locals. In determining the goodness of fit of the model, a p-value equivalent to 0.04 was obtained through Analysis of Variance (ANOVA). A p-value of less than 0.05 implies that the statistical model fits the data set.

The multiple linear regression model found that perception ($p=0.06$) does not significantly influence, while values ($p=0.05$) significantly influence conservation attitude. Out of the two (2) independent variables, only the values influence the conservation attitude. Interestingly, the influence of values towards conservation is inversely proportional. This finding explains the moderately negative values and moderately positive conservation attitude towards *H. indus*. The moderately negative values result from aquaculture pestering, while conservation laws' awareness encourages a moderately positive conservation attitude.

CONCLUSIONS

The respondents demonstrated a moderately negative perception and values but a moderately positive conservation attitude towards *H. indus*. While it is true that the raptor is an aquaculture pest, the enactment of government laws protecting *H. indus* is an essential factor for conservation. Strict enforcement measures are necessary to ensure that the local population of *H. indus* is conserved and protected. Moreover, there is a need to develop a conservation education program to foster positive perceptions and values towards *H. indus*.

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ACKNOWLEDGEMENTS

The authors would like to acknowledge Dr. Ma. Christina De Las Llagas, Chairperson of the Biology Department of Ateneo de Davao University, for providing administrative and logistic support. Special thanks to Dr. Christie Jean V. Ganiera, President, and Dr. Lilybeth M. Matunhay, VP for RDE of Compostela Valley State College (CVSC), and Mr. Jerd M. Dela Gente, Data Analyst affiliated with Davao Oriental State College of Science and Technology (DOSCST).