

# The Link Between Conservation and Education

Sharon Gursky and Lori Fields

*Department of Anthropology, Texas A&M University, College Station, TX, USA*

**Abstract:** While extensive research has been conducted in Indonesia on non-human primate conservation, there have only been a handful of projects that address how Indonesians perceive wildlife and conservation efforts. From June–August 2015, we conducted 75 interviews in the village of Batuputih in Sulawesi, Indonesia. This village abuts Tangkoko Nature Reserve and has been the recipient of conservation efforts concerning the reserve and its wildlife for more than 30 years. All interviews were conducted in the Indonesian language and recorded on a digital recorder for later translation. We noted demographic information for each interviewee, which included age, gender, occupation, education, household income, and religion, and then recorded information pertaining to personal feelings and beliefs about tarsiers, macaques, and nature. The results of this preliminary study suggest that neither gender nor religion affected the villagers' attitudes toward nature or conservation. The effect of reported monthly household income on the villagers' attitude toward conservation was also not statistically significant. Positive attitudes toward nature and conservation became more prevalent, however, as the level of education increased. Individuals with a high-school education regularly believed conservation was important, while those with only an elementary-level education rarely reported that conservation or nature was important. Over 85% of the people interviewed had difficulties with monkeys raiding their gardens. More than 45% of the people interviewed had had a monkey or a tarsier as a pet in their home within the preceding 12 months. The preliminary results of this study suggest that, despite more than 30 years of conservation efforts in Tangkoko Nature Reserve, the majority of the local villagers do not believe that conservation is important. Due to the strong link between education and attitudes about conservation, conservation agencies should dedicate greater efforts toward educating the local populace.

**Key words:** Primate, Indonesia. *Tarsius*, *Macaca*, Sulawesi

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## Introduction

Conservation projects throughout the world have been relatively unsuccessful as indicated by the continued decline in the populations of previously identified threatened species, by the continued destruction of forested habitat, and by the ongoing extinction of numerous species (IUCN 2018). Reflection concerning why so many conservation projects have been unsuccessful has led to the recognition that conservationists have omitted to incorporate an important variable into their conservation endeavors. The missing component is people (Riley *et al.* 2011; Fuentes 2012). While conservationists have been actively studying the needs and requirements of organisms in their natural environment, they seem to have forgotten that these organisms share their environment with a human population. Conservationists rarely consider the local populace's perception or attitude toward the organisms being protected, toward nature, or even the ideal of conservation in

general. That is, do local people even have a word for conservation in their local language?

Ethnoprimateology, the study of the interactions between human and non-human primates, is a critical component for us understand how people perceive wildlife and conservation efforts (Riley *et al.* 2011; Fuentes 2012). It not only illuminates the relationship between a particular group of people or individuals and sympatric non-human primates, but also informs our understanding of the broader pattern of relationships among humans, animals, and the environment (Sponsel 1997). Many cultures recognize non-human primates as unique among animals because of their observable physical and behavioral similarities to humans (Knight 1999; Riley 2010). People often ascribe human personality, intentionality, and emotions to non-human animals, including non-human primates (Ingold 1994; Knight 2005). Consequently,

non-human primates are frequently anthropomorphized, and their actions, for good or bad, are judged on a human moral framework (Hill and Webber 2010). Crop raiding primates, for example, are often described using a language of criminality (Knight 2006). Farmers in Uganda refer to crop raiding baboons (*Papio anubis*) as “the enemy” or “Kony,” in reference to the guerrilla warlord Joseph Kony (Hill and Webber 2010). Baboons and other monkeys are also viewed as intelligent, vindictive, faithful, and honest, depending on their foraging and feeding patterns (Hill and Webber 2010).

People’s perspectives of non-human primates reflect their cultural knowledge and expectations of the world around them. Attitudes towards animals and conservation are impacted by both past interactions and demographic variables such as religion (Wheatley 1999), length of residence or immigration (Peterson *et al.* 2015), and occupation (Khatun *et al.* 2012). In Bali, certain age/sex classes of long-tailed macaques (*Macaca fascicularis*)—adults and sub-adults—are more frequently involved in aggressive encounters with humans (Fuentes and Gamerl 2005), which likely affects people’s attitudes towards age/sex classes differently. The monkeys living around sacred temples in Bali are conferred a degree of tolerance that does not transfer to their interactions with neighboring farmers or market vendors (Fuentes 2010). These examples highlight the need to examine interspecies interactions as they are situated in demographic, social, political, historical, and economic contexts.

Cultural perceptions are clearly an important component for projects that demand cooperation between local people and conservationists. Yet very little is known about the views of Indonesians toward nature and wildlife. This is surprising for two main reasons. First, Indonesia belongs to the Sundaland Biodiversity Hotspot (Whitten *et al.* 1999; Supriatna *et al.* 2010), and second, Indonesia is one of the most populated countries in the world (Grow *et al.* 2010). Habitat destruction is consequently a serious threat to the wildlife throughout the Indonesian archipelago (Grow *et al.* 2010; IUCN 2018). More than 84% of Indonesia’s primate species are threatened with extinction (IUCN 2018). Recent shifts in Indonesian national park policy, including transferring authority over forests to communities, have contributed to rapid deforestation and the encroachment of villages into national parks (Grow *et al.* 2014). While conservation efforts are more necessary than ever before, it is difficult to develop conservation plans that take into account national law, without an understanding of the economies and attitudes of the local human populations.

While extensive primate research has been conducted in Indonesia, there have only been a handful of ethnoprimateological research projects that address how local Indonesians perceive wildlife and conservation efforts. Lane *et al.* (2010) conducted a study of the relationship between long-tailed macaques (*Macaca fascicularis*) and the human residents on Bali. The authors predicted that the Balinese Hindu belief that macaques should be respected would protect the monkeys, but this was not the case. Schilaci *et al.* (2010) noted that the monkeys are often shot at with air-guns, as they are

economic liabilities to farmers because of their crop raiding. Both Lane *et al.* (2010) and Schilaci *et al.* (2010) suggested that tolerance of the monkey’s presence may be due to financial benefits from the tourism industry rather than the monkey’s sacred cultural standing. The primary goal of this paper is to explore how one Indonesian village perceives conservation and identify the variables that affect their perception.

## Methods

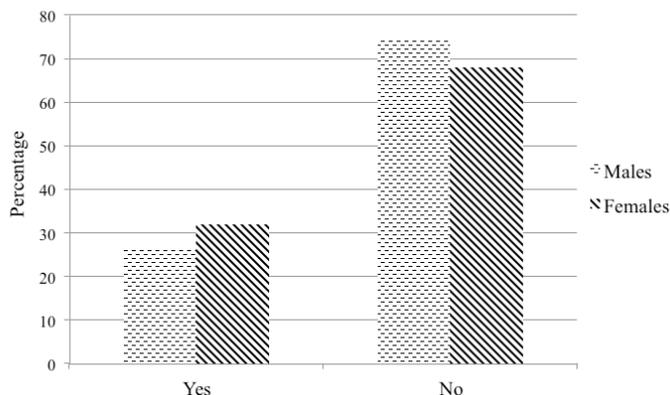
Data were collected in Batuputih, Sulawesi, Indonesia, from May to August 2015. This village was chosen for several reasons. First, the village of Batuputih abuts the Tangkoko Nature Reserve, that has been the recipient of conservation research for more than 30 years. Second, the village itself has also been the recipient of numerous conservation/development initiatives promoted by numerous conservation agencies. The initiatives have included chicken farming, bee farming, and the development of ecotourism, but only ecotourism has been successfully implemented.

We spent approximately 60 days in the village conducting semi-structured interviews (McNiven and Russell 2005). During the interviews, we collected demographic information including age, gender, occupation, education level, household income and religion. We asked questions about the interviewees personal feelings, experiences, and beliefs about tarsiers, macaques, and nature, and whether or not they had had issues with crop raiding, had wild animals as pets, and about their interactions with tourism. We also asked if they knew any stories, parables, or songs (folklore or indigenous knowledge) or Bible/Koran verses that provide guidance about how people should integrate with nature and wildlife.

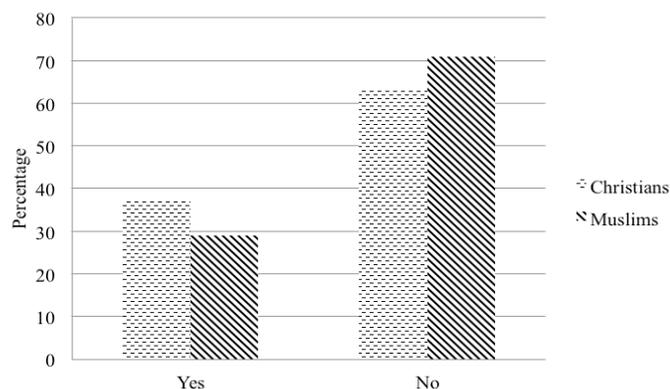
To ensure the project’s success, all interviews were conducted in the Indonesian language, Bahasa. SG has social relationships with many of the villagers, which facilitated her ability to ask the locals about their perspectives regarding nature, conservation and animals. She is also fluent in Bahasa, which allowed her to perceive the nuances in the villagers’ verbal and gestural responses. The interviews were tape recorded. We also employed a research assistant from Batuputih village to assist with interviews and translation. A sample of 75 participants was obtained.

## Results

The results of this preliminary study suggest that reported gender (male or female) did not affect the local people’s attitudes toward nature or conservation (Fig. 1). When asked if they believe conservation is important approximately 73% of males and 68% of females interviewed indicated that conservation was not important to them. There was no statistical difference between males and females in their attitude toward conservation ( $U = 2.5$ ;  $p = 0.281$ ). This preliminary study also suggests that there is no effect of religion on the local people’s attitude toward nature or conservation (Fig. 2). When asked if they believe that conservation is important,



**Figure 1.** The percent of males and females interviewed in the village of Batuputih, Sulawesi Indonesia who believe that conservation is important.

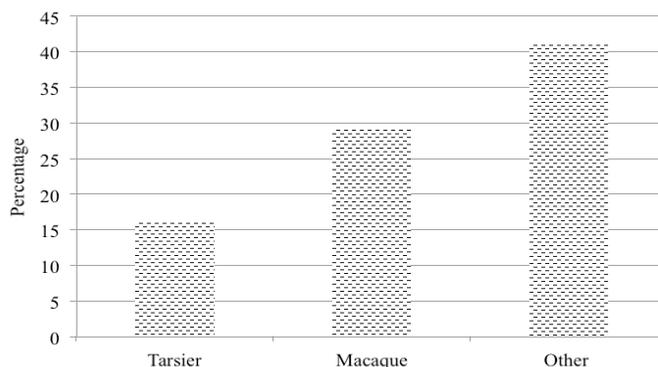


**Figure 2.** The percent of Christians and Muslims interviewed in the village of Batuputih Sulawesi Indonesia who believe conservation is important.

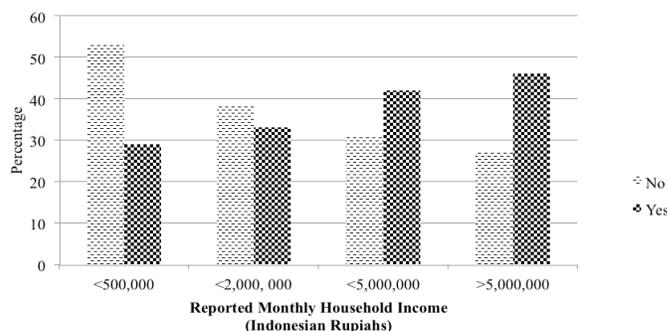
approximately 65% of the Christians and 71% of Muslims interviewed replied that conservation was not important to them. There was no statistical difference between Christians and Muslims in their attitude toward conservation ( $U = 2.5$ ;  $p = 0.383$ ).

When asked if they ever had a forest animal as a pet in their home, all of the interviewees replied in the affirmative. More than 45% of the people interviewed replied that they had had a pet within a year prior to the interview (Fig. 3). Over 85% of the interviewees had difficulties with monkeys raiding their gardens. The majority of the pet monkeys were captured when the monkeys were crop-raiding gardens. Tarsiers were obtained when individuals were clearing land for gardens and their sleeping sites were disturbed.

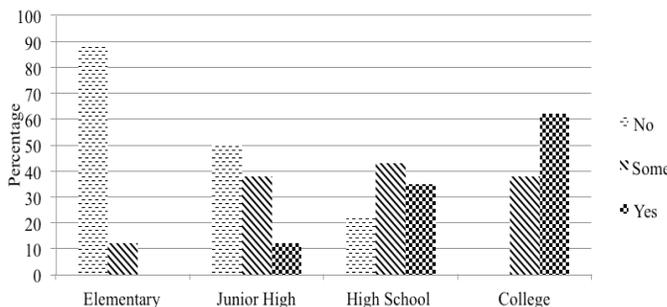
The relationship between reported monthly household income and conservation attitude was more complicated. In Batuputih, 22% of the interviewees reported having a monthly household income of less than 500,000 rupiahs (approximately US\$36; March 2018), and 28% reported monthly incomes greater than 500,000rp but less than 2,000,000rp. Thirty-five percent reported monthly incomes greater than 2,000,000rp but less than 5,000,000rp, and 15% reported monthly incomes greater than 5,000,000rp. Individuals with higher incomes were more likely than those with lower incomes to have a positive attitude about the importance of conservation (Fig. 4). Conservation was deemed unimportant by 45% individuals earning less than two million rupiahs but



**Figure 3.** The percentage of individuals interviewed in Batuputih, Sulawesi, Indonesia who reported having a tarsier, macaque, or other forest animal as a pet within the last twelve months.



**Figure 4.** Figure 4. The percent of individuals interviewed in the village of Batuputih, Sulawesi Indonesia (broken down by reported monthly household income Indonesian rupiahs) who believe that conservation is important.



**Figure 5.** The percentage of individuals interviewed in Batuputih, Sulawesi Indonesia, who according to reported level of education believe that conservation is important.

only 29% of individuals earning more than two million rupiahs per month. Individuals earning below two million rupiahs indicated conservation was important approximately 31% of the time, whereas individuals earning more than 2 million indicated conservation was important 44% of the time. The effect of income on perception toward conservation, while a clear trend, was not statistically significant ( $\chi^2 = 3.59$ ;  $p = 0.0657$ ).

The relationship between education and conservation was straight forward. As level of education increased, so did positive attitudes toward nature and conservation (Fig. 5). Individuals with a high school or college education regularly indicated that conservation was important, while individuals who only attended elementary school or junior high school rarely suggested that conservation or nature is important. The effect of education on perception toward conservation was statistically significant ( $\chi^2 = 19.53$ ;  $p = 0.001$ ).

## Discussion

The results of this preliminary study suggest that despite more than 30 years of conservation efforts in Tangkoko Nature Reserve and in the village of Batuputih, the local villagers still do not acknowledge that conservation is important. This result is reflected in the fact that nearly half of the people interviewed had a pet primate at some point during the previous 12 months. When they encountered a primate, be it a monkey or a tarsier, they did not hesitate to try and capture it. Whether they captured it for a pet, for sale or for food could not be adequately determined.

Gender had no effect on the local people's perception of the importance of conservation. The lack of evidence for a gender difference in attitude toward conservation is somewhat surprising given that numerous recent studies have found that females often express greater levels of concern about environmental problems than do males (Davidson and Freudenburg 1996; Zelezny *et al.* 2000; Mattheis *et al.* 2002; Hunter *et al.* 2004; Sherkat and Ellison 2007). This gender difference in attitude toward the environment has been attributed to a number of factors, including females' sense of emotional empathy (Arnocky and Stroink 2011), a stronger response to the harmful effects of deteriorating environmental conditions (Stern *et al.* 1993), and socialization processes that promote female interdependence and an ethic of care (Zelezny *et al.* 2000).

However, there is some evidence that this pattern of gender difference in environmental concern is not universal. In North America, Flynn *et al.* (1994) found that white females expressed greater concern about environmental health risks than white males. However, they did not observe this difference among other ethnic groups. Similarly, Greenberg and Schneider (1995) found that females had a higher level of environmental concern than males in American neighborhoods with relatively low exposure to environmental hazards, but not in neighborhoods exposed to multiple environmental stressors. In Nigeria, Ogunbode and Arnold (2012) found that although males were more knowledgeable about environmental problems and more likely to encounter environment-related information than females, there was no significant gender difference in environmental concern.

In this preliminary study, income had a slight effect, albeit not statistically significant, on the local people's perception of the importance of conservation. The trend of rich people having slightly more concern for the environment has been previously reported (Fairbrother 2013), but the majority of scientists have observed no effect of income on people's perception of the importance of conservation. Pampel (2014) attributes the inconsistent effect of income on environmental concern to the difficulty of obtaining valid and reliable personal income measures. In this study, the lack of a statistically significant relationship between monthly household income and attitude toward conservation might be a reflection of the fact that education is only one way that people in this community are economically mobile. A large proportion of

the villagers are subsistence fishermen and do not make their living in traditional office or factory positions.

The only variable in this preliminary study that seemed to inspire a positive attitude toward conservation was education. Individuals with high school and college education were substantially more likely to report that conservation was important. Pampel (2014) found that education is generally the best predictor of environmental concern. Other researchers have also found that education generally has the most consistent relationship with environmental concern (van Liere and Dunlap 1980; McMillan *et al.* 1992). Not only does education expose individuals to a broad range of ideas and beliefs and encourage a more liberal-minded perspective, but education may partly explain the relationship between income and environmental concern because wealthier individuals typically achieve higher levels of education. Findings by Fiallo and Jacobson (1994) in Ecuador highlighted that those with more years of education supported initiatives to protect and conserve the environment. A similar observation was made by Wall (1995) in Canada who found a close association between higher education and increasing concerns for the environment. After analyzing data from the International Social Survey Program for 21 countries, Ignatow (2006) found that education correlated positively with ecological concerns for the environment. Clearly, for conservation efforts to succeed, more effort toward educating the local populace should be a priority for conservation agencies. Education should not be limited to conservation education, but education in the broader sense, *sensu latu*.

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*Authors' address:*

**Sharon Gursky and Lori Fields**, Department of Anthropology, Texas A&M University College Station, TX 77843-4352, USA. *E-mail of first author:* <gursky@tamu.edu>.

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