

Local community characteristics and potential conflicts around Asian tapir habitat in Batang Gadis National Park, Sumatra, Indonesia

WANDA KUSWANDA¹ , FREDDY JONTARA HUTAPEA² 
TITIEK SETYAWATI²  and AGUS PURWOKO^{*3} 

Abstract The Asian tapir *Tapirus indicus* population has decreased as a result of habitat destruction and degradation, illegal hunting and negative human–tapir interactions. Although this species is categorized as Endangered on the IUCN Red List and is a protected species in Indonesia, where it occurs on Sumatra, studies of its ecology and behaviour and of interactions with people remain limited. We investigated the characteristics of local communities around tapir habitat in Batang Gadis National Park and the interactions of people with tapirs, and assessed the potential for future negative interactions. This study took place in March and October 2021 in Sopotinjak and Pagar Gunung villages. We conducted interviews, using questionnaires, amongst local communities that are familiar with tapirs. The communities belong to the Mandailing Tribe, comprising farmers that frequently access the adjacent forest to support their livelihoods. Local people need protein from animals, but they do not hunt the tapir. Negative human–tapir interactions could potentially increase in the future if tapir browsing intensity in community gardens increases and farmers suffer significant economic losses. We encourage Batang Gadis National Park authorities to develop a human–tapir co-existence management system and to protect tapir habitat.

Keywords Asian tapir, Batang Gadis National Park, browsing intensity, competitions, Pagar Gunung, Sopotinjak, *Tapirus indicus*

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The Asian tapir *Tapirus indicus* is the only *Tapirus* species inhabiting Southeast Asia (Novarino, 2005; O’Farrill et al., 2013). In Indonesia this species occurs only on Sumatra (Holden et al., 2003). The Asian tapir

population continues to decline as a result of habitat loss and fragmentation, human–tapir conflict and localized hunting (Novarino, 2005; Traeholt et al., 2016; Samantha et al., 2020). The current estimate of the global Asian tapir population in the wild is < 2,500 individuals (with < 500 individuals on Sumatra), and this is projected to decline a further 20% by 2040 (Traeholt et al., 2016). The species is categorized as Endangered on the IUCN Red List and is listed in Appendix I of CITES (Traeholt et al., 2016). In Indonesia the species has been categorized as protected since 1931 (Traeholt et al., 2016).

Compared to other local wildlife species such as the Sumatran elephant *Elephas maximus sumatranus* and Sumatran rhinoceros *Dicerorhinus sumatrensis*, the Asian tapir on Sumatra has received relatively little attention from researchers (Ardiantiono et al., 2016). Consequently, little is known about the tapir’s ecology and behaviour there and of any interactions with people.

Batang Gadis National Park is home to numerous large mammals, including the Asian tapir. This area was designated as a national park in 2004. Located in Mandailing Natal Regency, northern Sumatra, the Park covers c. 1,080 km² of tropical rainforest at altitudes of 300–2,145 m (Wibisono et al., 2009). It has been reported previously that the Asian tapir density in this National Park is c. 0.09 individuals/ha (Kuswanda & Mukhtar, 2010). The Park is surrounded by local communities, but the impacts of their activities on the tapir population and its ecology are unknown. We studied the characteristics of local communities around tapir habitat in Batang Gadis National Park, the interactions of local people with tapirs, and the potential for negative interactions between people and tapirs and competition between them for resources.

We conducted this study in March and October 2021 in Sopotinjak and Pagar Gunung villages, adjacent to tapir habitat (Fig. 1). The total numbers of households in Sopotinjak and Pagar Gunung are c. 66 and 48, respectively (BPS–Statistics of Mandailing Natal Regency, 2018). We selected 23 and 20 respondents (one respondent per household) in Sopotinjak and Pagar Gunung villages for interviews (Supplementary Material 1). We conducted most of the interviews in Indonesian, and in some cases we hired local interpreters for respondents who could not speak Indonesian. Interviews lasted c. 60–90 min. We also collected information from respondents by asking

*Corresponding author, agus9@usu.ac.id

¹Research Center for Applied Zoology, National Research and Innovation Agency (BRIN), Bogor, West Java, Indonesia

²Research Center for Ecology and Ethnobiology, National Research and Innovation Agency (BRIN), Bogor, West Java, Indonesia

³Faculty of Forestry, Universitas Sumatera Utara, Padang Bulan Medan, North Sumatra, Indonesia

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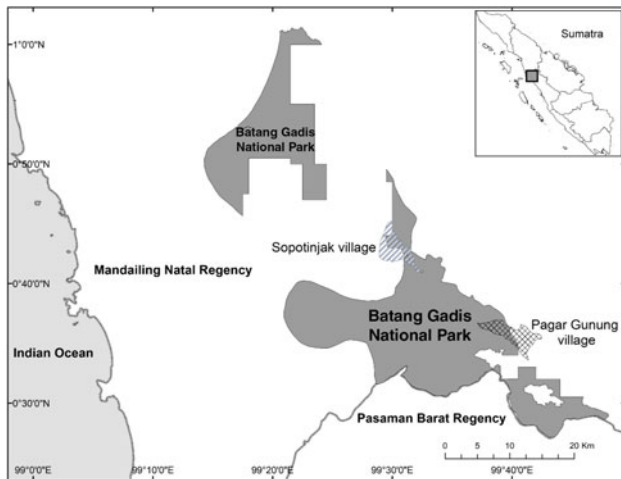


FIG. 1 The location of Sopotinjak and Pagar Gunung villages in Batang Gadis National Park, Sumatra, Indonesia.

additional questions that arose during the course of the interviews, and we recorded the responses. We spent 1–2 weeks in each village. Respondents were aged 25–60 years (39 respondents) and > 60 years (4 respondents).

The communities of both villages are of the Mandailing Tribe. These communities have lived adjacent to the forest for generations and depend on forest resources for various purposes such as food and medicine. Most villagers were farmers who spent most of their time in their gardens and paddy fields (Table 1). The majority (81.6%) of respondents

TABLE 1 The number (and per cent) of local people in Sopotinjak and Pagar Gunung villages in Batang Gadis National Park, Sumatra, Indonesia (Fig. 1) who regularly enter tapir forest habitat, and who engage in various activities in the forest and in their fields.

| | Sopotinjak (n = 23) | Pagar Gunung (n = 20) | Mean % |
|---|------------------------|-----------------------------|--------|
| Entering tapir forest habitat | | | |
| (a) Never | 1 (4.3) | 0 | 2.2 |
| (b) Rarely | 12 (52.2) | 1 (5.0) | 28.6 |
| (c) Often (≥ 5 times/ month) | 10 (43.5) | 19 (95.0) | 69.2 |
| Activities in forest/fields | | | |
| (a) Cutting trees | 12 (52.2) | 7 (35.0) | 43.6 |
| (b) Establishing gardens | 16 (69.6) | 16 (80.0) | 74.8 |
| (c) Working in rice paddy/other fields | 18 (78.3) | 17 (85.0) | 81.6 |
| (d) Gathering firewood | 19 (82.6) | 14 (70.0) | 76.3 |
| (e) Collecting tree sap | 9 (39.1) | 2 (10.0) | 24.6 |
| (f) Hunting | 7 (30.4) | 0 | 15.2 |
| (h) Collecting non-timber forest products | 11 (47.8) | 0 | 23.9 |

work in paddy fields. Local people also cultivate a variety of crops, such as vegetables (e.g. pumpkin, corn and cassava), *palawija* (herbs), durian, cinnamon, jackfruit, bitter beans, river tamarind, coffee and areca nuts. Local people also frequently entered nearby forests to establish new gardens, cut trees, collect firewood, rattan, tree sap (*kemenyan* *Styrax* sp. and palm *Arenga pinnata*), and to hunt for birds and deer. We found that 69.2% of the respondents of Sopotinjak and Pagar Gunung accessed their gardens by crossing or entering tapir habitat in the forests. This situation could potentially increase interactions between people and tapirs as these locations are also where tapirs seek food.

The Mandailing communities have co-existed with tapirs for years, are aware of the conservation status of the tapir and have positive perceptions of it. We found that 95.7% of respondents in both villages were aware of the existence of tapirs (known as *sipan*) and believed that tapirs help spread the seeds of plants in Batang Gadis National Park. Local people frequently found plants sprouting from tapir faeces. Tapirs frequently visit the community at night to search for termites, ants and salty soil near habitations. This is in line with previous research reporting that tapirs need salt and minerals to aid digestion (Holden et al., 2003; Novarino, 2005; Tawa et al., 2021).

Tapirs frequently cross community gardens and paddy fields to forage. Although local communities often find tapir footprints and faeces in their gardens and rice fields, they rarely encounter tapirs directly because of the species' nocturnal habits (Dutra & Young, 2016). Local people stated that the favourite foods of tapirs are pumpkins, bitter beans, river tamarinds and jackfruits, that they prefer plants that have white gummy latex such as jackfruit leaves, and that tapirs enter community gardens more frequently when people cultivate these crops.

Local people did not react negatively to tapirs browsing in their gardens. There are no records of local communities hunting, killing or poisoning tapirs in this region (Kuswanda et al., 2023). The fact that the community is dominated by Muslims has prevented local people from hunting and consuming the tapir, which is considered *haram* (forbidden food) by Muslims because it is regarded as a member of the pig family. Furthermore, nobody hunts tapirs for commercial reasons as there is no local market for their meat.

Tapirs are selective browsers, preferring young leaves, shoots and fruits, and they need a large home range to meet their needs (Maharani et al., 2019). It is this that results in them entering or crossing community gardens and increases the likelihood they will encounter people. This has been observed in the central Andes of Colombia, where the conversion of forest for potato cultivation has resulted in human–tapir competition, leading to local communities killing and driving out tapirs (Suárez & Lizcano, 2002).

Although we did not record negative interactions between local communities and tapirs around Batang Gadis

National Park, competition for vegetation and space will potentially increase in the future if tapir habitat continues to be disrupted and destroyed. The Park authorities need to circumvent any future human–tapir competition by protecting the Park from illegal logging and land encroachment, increasing tapir food plants on tapir trails at Park boundaries and on community lands, providing cultivation training and assistance regarding harvestable plant species that are not preferred by tapirs, and developing an online reporting system through which the community can register concerns regarding tapirs. We also recommend that Batang Gadis National Park develop a human–tapir co-existence management system.

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Conflicts of interest None.

Ethical standards This study followed the ethical guidelines of the Association of Social Anthropologists of the UK and Commonwealth (Association of Social Anthropologists, 2011), received approval from the Environment and Forestry Research Development Institute of Aek Nauli (Research Permit No ST. 65/BP2LHK ANU-1/Peg.3.0/03/2021) and otherwise abided by the *Oryx* guidelines on ethical standards.

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