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Enhancing Community Education in Tumbang Tahai as an Effort to Manage Long-tailed Monkey Conflict and Zoonosis (*Macaca fascicularis*) in Settlements

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Abstract: The conflict between Long-tailed Monkeys and the villagers of Tumbang Tahai Village is a significant issue that must be addressed. Two hundred long-tailed monkeys colonies have infiltrated communities, causing damage and disruption to the facilities of the villagers. It is widely acknowledged that enhancing community education is critical in addressing the challenges afflicting Tumbang Tahai Village. This activity aims to enhance the knowledge and understanding of the villagers of Tumbang Tahai Village regarding managing and resolving conflicts with long-tailed monkeys, including strategies for responding to bites or assaults and initiatives to reduce conflict. Residents of RT 3 / RW 1 Tumbang Tahai Village, Bukit Batu District, Palangka Raya City, Central Kalimantan, comprised the implementing partners. The method utilised in Community Service is Participatory Action Research (PAR), which aims to empower community members to become agents of change through knowledge acquisition. On Wednesday, October 25, 2023, community service activities were conducted at the SDN 03 Tumbang Tahai. These activities consisted of multiple stages: observation, preparation, implementation, and evaluation. Activities include distributing materials on conflict prevention and the risk of zoonotic transmission, discussion, seed distribution for monitoring purposes, and assessment via surveys, pre-tests, and post-tests. The evaluation results demonstrated a discernible enhancement in knowledge after the training. On average, the post-test score rose from 51% on the pre-test to 97.5%. This indicates that the participants' understanding of conflict resolution and zoonotic improved after their participation in the socialisation program.
Keywords: education; long-tailed monkey; mitigation; tumbang tahai

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INTRODUCTION

The Nyaru Menteng Arboretum is a forest region abundant in plant and animal life, rendering it a germplasm conservation area for the peat swamp forest ecosystem of Central Kalimantan. The Nyaru Menteng Arboretum, with 65.2 hectares, is comprised of a lowland

tropical forest characterised by peaty and swampy soil. Bornean orangutans (*Pongo pygmaeus*) inhabit the rehabilitation centre, while long-tailed monkeys (*Macaca fascicularis*, Raffles, 1821) inhabit the forest region of Nyaru Menteng.

The Long-tailed Monkey is classified as an endangered species within the Cercopitacidae family, as determined by the IUCN 2022. The primate in question is referred to locally as "*Bakei*" and is distinguished by its long tail and body fur of an ash hue. *Bakei* are forested group creatures that consume fruit. Social, erotic, and territorial defence behaviours are exhibited by long-tailed monkeys (Hasanah et al., 2022).

Long-tailed monkeys from the village of Tumbang Tahai, which is adjacent to the arboretum, frequently penetrates settlements in search of food, inciting conflict with the local people. As defined in Minister of Forestry Regulation No. P. 48/Menhut-II/2008, human-wildlife conflict is a confrontation between human beings and wildlife resulting from various adverse direct and indirect interactions. Human interactions with wildlife are frequently marred by negative consequences, including diminished respect for wildlife and an overall decline in conservation initiatives (Santoso et al., 2019).

Recently, there has been an increase in human-wildlife conflict (Santoso et al., 2019). The conflict between long-tailed monkeys and the Tumbang Tahai RT01/RW03 villagers is a critical issue that demands urgent attention. Considering its critical nature and potential ramifications for various resident groups and primate animal welfare, it is imperative to address the issue through education. The fact that long-tailed monkey causes material losses contributes to the potential physical, mental, and health damages that residents may endure. It has been established through research Hambali et al. (2012) and Md-Zain et al. (2014) that the disruptive behaviour exhibited by the animals has the potential to induce trauma in humans. The neglect of this situation may potentially adversely affect the villagers residing in Tumbang Tahai Village, who suffer from disturbances caused by animals. Potential health complications may arise due to the transmission of diseases from long-tailed monkey to humans or vice versa (zoonosis). Malaria, tuberculosis, and hepatitis are examples of zoonotic diseases that may be contracted via bites or direct physical contact with primates.

The purpose of this community service is to enhance the community of Tumbang Tahai Village's knowledge and comprehension of how to handle and mitigate conflicts between long-tailed monkeys and locals, as well as the measures taken to prevent bites or attacks. It is widely acknowledged that enhancing community education is crucial for resolving the issues occurring in Tumbang Tahai Village. By enhancing education and simulation about managing accidents caused by attacks, the community can become more aware of the need to resolve disputes with long-tailed monkey. In order to reduce the causes and effects of human-wildlife conflict, it is crucial to implement mitigation strategies that seek to increase human knowledge and improve their attitudes and perceptions regarding wildlife (Syafutra et al., 2023). Additionally, it can prevent the spread of diseases (zoonoses) resulting from prolonged exposure to wildlife. This solution is anticipated to enhance the community's quality of life by empowering members to maintain a balanced existence in the presence of wildlife.

METHOD

The long-tailed monkey conflict education strengthening activity was conducted using the Participatory Action

Research (PAR) method on Wednesday, October 25, 2023. The PAR approach aims to empower the community to become agents of change by fostering knowledge development. Commencing with observation and coordination and continuing through preparation, implementation, and evaluation, this community service is geared towards enhancing community empowerment and education (Afandi et al., 2022). An educational implementation activity was conducted at SDN 3 Tumbang Tahai, with an estimated attendance of twenty individuals. The partners in this community service were the residents of RT 03/RW 01, Tumbang Tahai Village, Bukit Batu District, Palangka Raya City, Central Kalimantan.

Community service is executed through the following three stages of implementation (Panjaitan et al., 2023):

Stage 1

During the initial stage, the service team coordinated with the head of RT 03 / RW 01 Tumbang Tahai Village, Bukit Batu District, Palangka Raya City, to discuss partner issues and potential solutions.

Stage 2

This stage includes the implementation of activities starting from filling out questionnaire surveys, pre-tests, presentation of material by the service team and resource persons.

Stage 3

The third stage consists of a post-test designed to assess the residents' comprehension of the material presented.

Stage 4

The fourth stage consists of monitoring partners' responses to the solutions provided as an evaluation stage.

The success and accomplishment indicators of this training were descriptively analysed based on the completion of the pre-test and post-test, the level of enthusiasm among all participants, and their level of participation.

RESULTS AND DISCUSSION

Twenty individuals attended this event, including five men and fifteen women who reside in RT 03/RW 01 Tumbang Tahai Village and interact directly with long-tailed monkeys daily. A pre-test was administered to ascertain the initial level of knowledge possessed by the local people. The pre-test results indicated that approximately 51% of the community still lacked knowledge regarding primates, particularly long-tailed monkeys. A questionnaire was administered to participants inquiring about their preliminary understanding of long-tailed monkey and the possibility of disease transmission. As indicated by the survey results, 90% possessed knowledge about primates (Figure 1).

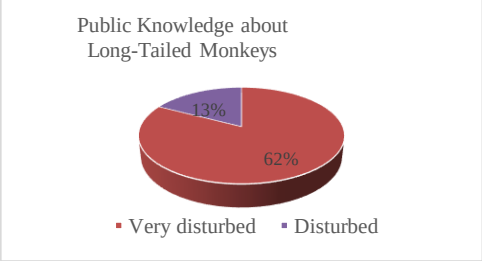

Figure 1 Community knowledge of long-tailed monkey

The survey results indicated that a significant proportion of the residents (62% of respondents) expressed distress regarding the presence of these primates in the settlement. The level of long-tailed monkey interference is shown in Figure 2.

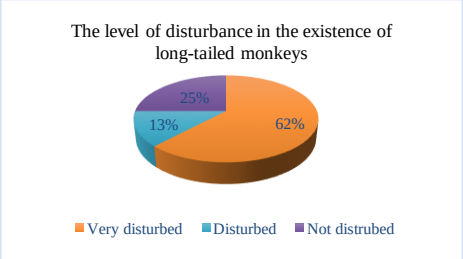

Figure 2 Level of long-tailed monkey disturbance

As illustrated in Figures 1 and 2, 75% of respondents indicate that long-tailed monkey disturbance takes the form of kitchen and ceiling damage, in addition to food theft involving fish, eggs, and fish aquaculture byproducts in the river).

The material was presented in two sessions, with speakers from the Biology Study Programme at FMIPA UPR addressing the first theme, "Mitigation of Long-tailed Monkey Conflict," and presenters from BOSF addressing the second theme, "Potential Zoonotic Transmission of Long-tailed Monkeys." The material was presented alongside queries and answers posed by the attending residents concerning the challenges they encountered.

The speakers distributed materials and facilitated interactive discussions during the counselling process. Rizka Hasanah S. Pd., M. Si. initiated the first session with a presentation on conflict resolution involving long-tailed monkeys (Figure 3). Long-tailed monkeys can be prevented by installing nets throughout the residence, preventing bites, and avoiding long-tailed monkey when it is attacked. Long-tailed monkeys are also protected from shooting and injury. To mitigate the situation, handling can be accomplished by contacting relevant parties. Conflict mitigation is additionally beneficial in that it enforces community education and sanctions to discourage the mistreatment of animals such as forcing long-tailed monkeys that may enter residential areas to retreat in an excessive manner (Rahmad et al., 2023).

Figure 3 Presentation of content for managing conflicts involving long-tailed monkey

The residents' zeal manifested itself in the form of complaints regarding home invasions by long-tailed monkeys, with nearly ten long-tailed monkeys launching assaults daily. Per their accounts, "*Bakei*" and over ten long-tailed monkeys enter their residence nearly daily, causing ceiling damage and thieving rice and fish side dishes (*iwak*). In order to prevent potential assaults, villagers commonly employ defensive measures such as establishing nets in their kitchens, employing catapults to frighten the '*Bakei*' away, and chasing them away with wood. Nevertheless, this has not dissuaded the *Bakei*. *Bakei* frequently establishes themselves in settlements comprising over fifty individuals. This dense population density suggests that the *Bakei* were compelled to forage for sustenance within the settlements due to the depletion of food resources in the forest, the dry season, and the absence of fruit. Long-tailed monkey colonies forage into settlements by entering people's kitchens and damaging facilities, causing losses to the community.

The second session discussed the possible zoonotic transmission involving animal-borne diseases and strategies for managing them. Zoonotic, defined as a disease that can be transmitted from animals to humans or vice versa, was the subject of the discussion. Dr. Arga Sawung Kusuma, a veterinary expert from BOSF (Borneo Orangutan Survival Foundation) and the speaker, discussed approaches to managing the potential for zoonotic transmission (Figure 4). This activity involved a speaker from BOSF where the orangutan rehabilitation centre is directly adjacent to the habitat of MEP and Tumbang Tahai residents. In his presentation, drh. Arga conveyed the zoonotic potential of MEP, such as tuberculosis, malaria, helminthiasis and HIV. The community was also educated about the symptoms of these diseases and the help that can be given if they find similar symptoms. Ultimately, it was

explained about first aid if bitten during the conflict with long-tailed monkey.

Figure 4 Content presentation for zoonotic

The dissemination of information regarding zoonotic transmission potential and conflict mitigation resulted in a rise in community awareness. The post-test data revealed that 97.5% of the community had acquired knowledge regarding long-tailed monkey disturbances and conflict prevention strategies.

Long-tailed Monkey, or *Bakei*, is a primate species inhabiting forests. While it is not classified as a protected species per P.20/MENLHK/SETJEN/KUM.1/6/ 2018, IUCN 2022 classifies it as endangered due to its exploitation as a game animal (IUCN, 2022).

Long-tailed monkeys in the Nyaru Menteng area, Bukit Batu District, Palangka Raya City live in contact with the people of Tumbang Tahai village. Several factors, including 1 cause long-tailed or *Bakei* monkeys that come down to settlements) lack of food. One of the factors causing conflict is the level of animal preference for food. In this case, it is generally a certain type of plant. Food has an important role because food is an essential factor that is a necessity of life for animals (Parakkasi, 1999). 2) The long-tailed monkey population is very large, about 200 monkeys consisting of 4 groups, and 3) the breeding of monkeys is very fast, while the food sources in the forest do not meet and depend on the fruiting season. It is suspected that because the long-tailed monkey population is increasing but not accompanied by food availability, the wildlife is expanding its exploration area to find other food sources so that it enters residential areas. This opinion is reinforced by (Rahmawati et al., 2014), who examined changes in the behaviour of long-tailed monkeys around other Arboretum forests in agonistic behaviour to get food. Furthermore, Ismi Rahmawati et al. (2014) stated that the disturbing behaviour of Long-tailed Monkeys included biting, taking things at residents' stalls, taking fruits from residents' plantations, and jumping on the roofs of residents' houses.

Interviews with the head of RT 03/RW01 and residents indicate approximately 200 long-tailed monkeys in Tumbang Tahai Village, organised into four groups/colonies. Since long-tailed monkey groups typically comprise 20–50 individuals each (Bercovitch & Huffman, 1999), the assumption that Tumbang Tahai village has a large population is accurate, as the 200 long-tailed monkeys in four groups exceed the normal population.

Following the delivery of the material, the activity proceeded with the distribution of seedlings of Soursop and Petai fruits. This practice is implemented as a sustained effort to safeguard the long-tailed monkey population and ensure ample fruiting plants for the monkeys' food supply in the forest. The effectiveness of the planted fruiting plants is assessed through monitoring every month. Counseling is anticipated to add insight to the community about conservative forest management procedures and how to grow crops (Hanum et al., 2022).

Tree seedling planting is an effort to reforest fruiting plants in order to increase the amount of food availability for primate animals. Long-tailed monkeys that descend to settlements lack food availability around the arboretum area, so they descend to settlements in search of food. Long-tailed monkeys that

belong to the frugivorous group have a food composition including fruits with a portion of 57%, leaves with a portion of 17%, insects with a portion of 8%, flowers with a portion of 4%, tree buds with a portion of 2%, and the rest in the form of grass, soil molluscs, fungi and various other small vertebrates (Supriatna & Wahyono, 2000). Tree planting efforts are needed to provide food trees, especially fruiting plants such as petai, rambutan, longan, and sawo, which are plant species that animals utilize as a food source. Plant organs commonly used as food by animals are fruits, young leaves and flowers. Tree planting is a long-term solution offered because long-tailed monkey also has an ecological function, which is to sow seeds for fruiting plants, so it has an important role in the conservation of plant species. The atmosphere of the activity implementation is shown in Figure 5.

Figure 5 The community appeared extremely enthusiastic about participating in the series of events

All participants expressed positive evaluations of this activity. The head of RT and the head of Village, in particular, provided testimonials in which they appreciated the activity's beneficial value for the residents of Tumbang Tahai. The village hopes that this activity can be continued in the future to educate the local people about the frequent conflicts that arise in settlements.

Documentation of participants filling out the questionnaire, pre-test and post-test is shown in Figure 6.

Figure 6 Participant completion of questionnaires, pre-test, and post-test

Animals that pose a threat to human life are required to be captured alive or herded back to their natural habitat due to circumstances beyond their control. Nevertheless, in cases where this is not feasible, the animal must be relocated to a conservation institution for care (Government Regulation No. 7/1999, Article 26, paragraph 1 about plant and Animal Preservation).

CONCLUSION

This community service has increased community knowledge, as indicated by the pre-test results, which rose from 51% to 97.5%. As a result, it is anticipated that this can resolve the conflicts between long-tailed monkeys and the villagers of Tumbang Tahai RT01/RW03. Conflict education will hopefully aid in preserving wildlife and maintaining harmony between locals and wildlife. These activities should be conducted regularly and adhere to specific themes. Their goals should be to offer solutions, aid in the resolution of problems, or advance scientific knowledge.

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