



Mitigation of Elephant Disturbance in Pemerihan Village, Bengkunt Sub-District, Pesisir Barat District

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Abstract

This study aims to describe the mitigation of elephant disturbance in Pemerihan Village, Bengkunt District, and West Coast District. The population in this study were all people who experienced disturbance by elephants in Pemerihan Village, Bengkunt District. The sample in this study was 52 families using a purposive sampling technique. Retrieval of data using questionnaires, observation, interviews, and documentation techniques. Data analysis using the Likert analysis technique. The results of the elephant disturbance mitigation research in Pemerihan Village are in a physical form by making guard towers, using below lights or large flashlights, and shooting firecrackers. Mitigation of elephant disturbance in the form of biology is carried out by making noise to drive the elephants away, keeping honey bees or bees ringing on the paths that are passed by elephants, and with the ERU (Elephant Responsive Unit). Mitigation of elephant disturbance in a social form is carried out by using tools that are used together to drive away elephants, forming a special task force (task force) to drive elephants into plantations and guarding plantation crops, using various sound devices such as spirit cannons and firecrackers.

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INTRODUCTION

Development is not only carried out with the reason of increasing the welfare of the community and the national economy but still paying attention to social, environmental, and ecosystem aspects so that sustainable development is achieved while maintaining the preservation of natural resources and biodiversity and their ecosystems (Ministry of Forestry, 2007).

Along with the times and increasing population growth, the conversion of forest land is also increasing, causing the fragmentation of animal habitats (Hidayat, 2018). Forest destruction and fragmentation of animal habitats for the expansion of agriculture or plantations, mining, and housing are the causes of interference between wildlife and humans. Habitat degradation causes these animals to enter agricultural land or community plantations adjacent to forest areas, thereby destroying the cultivated plants.

The conversion of forest land by humans causes the elephant's home range to decrease, as a result, elephants enter community plantations to meet their ecological, social and reproductive needs (Orga and Badola, 2018). Based on the Regulation of the Minister of Forestry Number: P.48/Menhut-II/2008 human-wildlife conflict is any interaction between humans and wild animals that hurts human social life, economy, culture, and efforts to conserve wild animals and their environment.

The human-elephant conflict does not have a single and simple solution. Good management is important to ensure its effectiveness (Chong and Norwana, 2015). Human-elephant conflict is very important to study to choose mitigation that can minimize the loss of both property and life. One of the wildlife that often experiences conflict with humans is the Sumatran elephant (*Elephas maximus sumatranus*) in Pemerihan Village, Bengkunat District, West Coast District.

Conflicts between elephants and humans are not only detrimental to humans, but to the elephants themselves (Pratiwi 2020; Rianti and Garsetiasih 2017). Existing conditions and threats can result in losses between the two parties, so it is necessary to mitigate between humans and elephants. This effort can be carried out by taking into account the interests of residents around the origin of the elephants, but it will not result in a decrease in the elephant population.

METHODS

This research will be carried out in Pemerihan Village, Bengkunat District, Pesisir Barat Regency in 2022. The choice of this location is because it is directly adjacent to the Bukit Barisan Selatan National Park, which is the habitat of wild animals, one of which is elephants, which often visit plantations and damage community plantation crops. In the village, there is also a post or hut, namely the Pemerihan resort which is a post where tame elephants are trained to patrol around the Bukit Barisan Selatan National Park. These tame elephants are trained to keep wild elephants from entering people's settlements so they don't damage community plantations in Pemerihan Village.

The population in this study is all people involved in conflict with elephants in Pemerihan Village, Bengkunat District, and West Coast District. Meanwhile, for the sample, the researchers took 44 respondents from the Pemerihan Village community and 8 respondents for Pemerihan ERU (Elephant Responsive Unit) officers, so a total of 52 respondents. In addition, researchers used data collection techniques including observation, questionnaires, and interviews.

RESULTS AND DISCUSSION

Overview of Research Locations

Astronomically, Pemerihan Village, Bengkunat District, is at 5°33'53" LS to 5°38'05" LS, 104°22'02" E to 104°25'06" E. The population of Pemerihan Village, Bengkunat District in 2022 is 2,314 people with a male population of 1,206 and a female population of 1,108. Pemerihan Village has an area of 15.77 km² with a population of 2,314 people. Most of the residents of Pemerihan Village have livelihoods as farmers with a percentage of 49.5%.

Pemerihan Village only has two educational facilities in the form of PAUD/TK and SD school buildings. The school facilities for SMA, SMK, SMP, and MTS are located in a neighboring village with a distance of 4-30 km from Pemerihan Village. For information, students who attend school in a neighboring village travel back and forth or PP, and the farthest school is reached at a distance of about 30 km in Tanjung Rejo Village by riding a motorbike.

We can see the administrative map of Pemerihan Village, Bengkunat District, West Coast Regency in Figure 1.

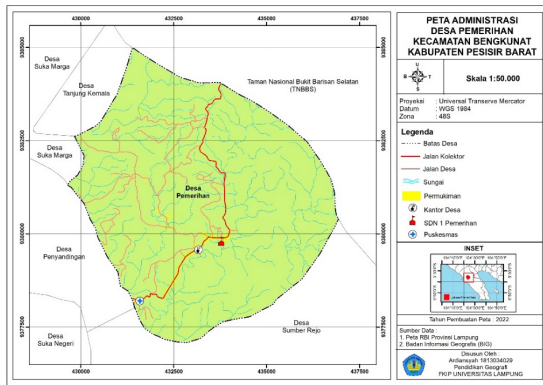


Figure 1. Administrative map of Pemeerihan Village, Bengkunt District

The results of this study are a form of mitigation carried out by the community in dealing with elephant disturbances in Pemeerihan Village, Bengkunt District, and West Coast District. The results of this study aim to determine the mitigation carried out by the community in dealing with elephant disturbances in Pemeerihan Village, Bengkunt District, and West Coast District. The forms of mitigation carried out by the Pemeerihan Village community in minimizing elephant disturbance include mitigation in a physical form, mitigation in a biological form, and mitigation in a social form.

Mitigation of Elephant Disturbance in Pemeerihan Village, Bengkunt District, West Coast District

Mitigation in Physical Form

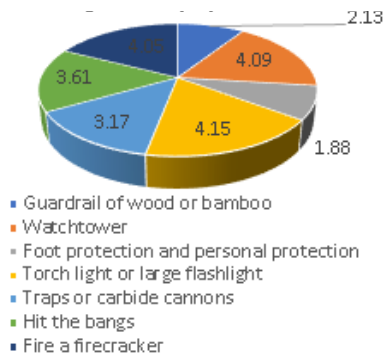


Figure 2. Mitigation in physical form

Mitigating elephant disturbance in physical form by using wooden or bamboo guardrails,

the community expressed an average attitude of disagreeing at (2.13) or 42.69%. The community has made guardrails from wood or bamboo but the results are ineffective, elephants can still destroy guardrails because elephants have large bodies and strong trunks. In contrast, research conducted by Berliani in the Journal of the Proceedings of the National Seminar on Biotik (2015: 52) states that in the Pante Ceureumen District, many make barbed fences (63.33%) to protect commodity crops from damage by elephants.

Then according to Berliani in the journal Proceedings of the Biotic National Seminar (2022: 18) stated that making electric fences is also an effort to prevent human-elephant conflicts from occurring. However, in Pemeerihan Village it was not carried out because it required a lot of money and maintenance in line with Yoza's research in the journal Proceedings of the National Seminar "Environmental Conservation and Disaster Mitigation" (2016: 257) which stated that barriers such as fences were usually only used by companies and wealthy farmers.

Mitigating elephant disturbances in physical form by constructing guard towers around plantation crops, the community expressed an average attitude of agreement (4.09). or by 81.92%. This tower serves to monitor the movement of elephants when they begin to approach residents' plantations. Usually, people guard their plantations at night until dawn because this is the time when wild elephants approach community plantations, in line with research conducted by Purwanuriski in the Belantara Journal (2022: 186) which states that land guarding is carried out late at night because elephants it could have gone undetected and suddenly crossed the river and damaged the community's crops. If the community does not guard the plantation at night, they do not rule out the possibility overnight that elephants can damage community plantations.

In various parts of other countries the use of guard towers is already familiar, according to Fernando in a book entitled Review of Human-Elephant Conflict Mitigation Measures Practiced in South Asia (2008: 5) which states that in some parts of Sri Lanka where the level of elephant conflict is high, huts are built on trees, whereas in areas with low levels of conflict, construction is on the ground. The guard tower in Pemeerihan Village uses wooden construction, as we can see

in the Figure 3.



Figure 3. The wooden guard tower in Pemerihan Village

As for the distribution map, the northern part of the guard towers is an area that has never experienced elephant disturbances or rarely experiences elephant disturbances because the elephant home range or Home Range is in the south and there is the Way Pemerihan River which is the boundary between community plantations.

Then the slope factor and land use in Pemerihan Village where in the south it has a flat slope while in the north it has a gentle slope in the south there are community plantations around the Way Pemerihan River which makes the northern part of the Pemerihan area rarely conflict between elephants and man. Below is a map of the distribution of guard towers in Pemerihan Village, Bengkulu District, West Coast District. We can see this in the Figure 4.

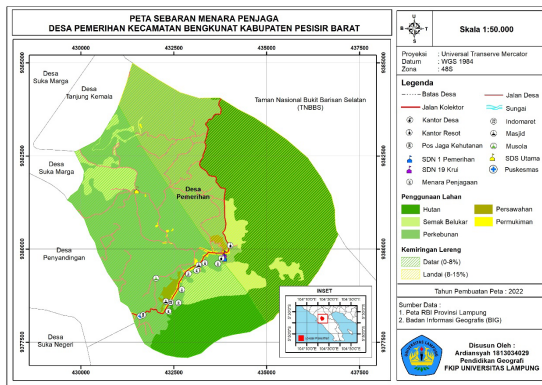


Figure 4. Map of Distribution of Guard Towers in Pemerihan Village

Meanwhile, the use of gaiters and other personal protection stated that the average disagreed was (1.88) or 37.69%, it was also less effective in driving away elephants, usually when the elephants came, they went straight to the scene so they didn't think about using gaiters. such as boots or other personal protective equipment. Usually the use of boots and other personal protection when people are looking for plantation products in the forest. These boots are used to protect feet from thorns or animal attacks in the forest.

The average community stated that they agreed to use a flashlight or a large flashlight during elephant patrols by (4.15) or 83.07%. The large torch or flashlight used by the community for lighting at night is very important to use and at the same time used to scare elephants by shining this flashlight towards the elephant's eyes.



Figure 5. Big Torch or Flashlight

Mitigation by using a straw or methylated cannon, the average response of the people is doubtful (3.17) or 63.46%. In the past, the use of jeduman or spirit cannons was very effective because the sound produced was very loud and scared the elephants, but over time this technique has become ineffective because elephants are intelligent animals so elephants learn about community efforts to drive elephants out of plantations.

Then hitting the kentongan and making bonfires, the community stated that the average was doubtful (3.61) or 72.30%. In the past, elephants were very afraid of this method, but gradually the use of kentongan to mitigate elephant disturbances is less effective.

For now, the most effective physical form of mitigation used by the Pemerihan Village com-

munity is by shooting firecrackers at elephants (4.05), or 81.15%. This technique is most effective besides making guard towers and using large flashlights or flashlights when elephant patrols. We can see the firecrackers used by the community in the Figure 6.



Figure 6. Firecrackers used by the community to drive away wild elephants

Mitigation in Biological Forms



Figure 7. Mitigation in Biological Forms

Mitigation of elephant disturbance in the form of biology carried out by the Pemerihan Village community by planting plants that elephants do not like, such as citrus, nutmeg, pepper, and coffee, the community stated that the average doubt was (3.13) or 62.69%. This planting has been carried out in Pemerihan Village by interfacing these plants with plantation crop commodities such as papaya and corn but still, the plants which elephants don't like are not effective for mitigation. In contrast to research conducted by Kuswanda in the journal *Innovation* (2018: 161), one type of plant that the community can continue to develop and which elephants do not like is orange groves. Oranges probably give off a pungent odor, so elephants ra-

rely or even have not found cases of conflict in citrus groves, such as in the Aras Senapal area, Bukit Mas Village.

Then using biological fences the average disagreement was (2.76) or 55.38%. The results are also not optimal, in line with Fernando's book entitled *Review of Human-Elephant Conflict Mitigation Measures Practiced in South Asia* (2008: 14), which states that thorny plant species such as agave, cactus, and bougainvillea have been tried as 'biological fences'. However, it is usually impractical to consistently act as an elephant barrier. The biological fence in Pemerihan Village in question is a large grass plant that can distract elephants but these elephants are looking for other ways to enter community plantations. This plant is used as a deterrent to elephants as well as to prevent erosion around the Way Pemerihan River.

Meanwhile using briquettes with a mixture of elephant dung and chili stated that they disagreed by (2.78) or by 55.76% was also less effective. Previously it had been tried out but even the people themselves were not strong enough for the smell produced from the combustion results.

Then the alternative way is to make loud noises to scare the elephants, the community stated that the average agreement was (4.03) or 80.76%. The noise that is meant by this is shouting that is done by the community together, this technique is quite effective in Pemerihan Village. According to Yoza in the journal *Proceedings of the National Seminar "Environmental Preservation and Disaster Mitigation"* (2016: 256) several places such as in Petapahan District usually use sounds using carbide cannons to scare elephants. the advantage of this technique is that it does not cost money because the noise is from human screams.

Mitigation techniques in the form of biology that were effectively carried out by the Pemerihan Village community stated that the average agreement was (4.07) or 81.53%, namely by raising honey bees or glancing bees on the paths traversed by elephants. The bees that are kept by the Pemerihan Village community are bees that have high economic value and also as a substitute for agricultural

products that fail to harvest due to attacks by wild elephants so that they can cover losses due to crop failure.

Honey bees are not cultivated by the people in Pemerihan Village because the climate there is not suitable. In contrast to the results of research conducted by Enu kwa in the *Journal of Wildlife and Biodiversity* (2017: 71) which states that elephants are usually afraid of bees because they can easily attack them when elephants disturb or shake the fence where the beehives are. This method has the advantage because, in addition to minimizing HEC (Human Elephant Conflict), bees also produce honey, thus increasing the community's economic income. Below is a picture of the bee cleansing which is cultivated by the community in Pemerihan Village, Bengkunt District, West Coast Regency.



Figure 8. Clanceng bees cultivated by the Pemerihan Village community

Another effort by herding groups of wild elephants using tamed elephants is considered effective in encouraging groups of wild elephants to enter the Bukit Barisan Selatan National Park area as far as 2-4 km. However, the use of these tame elephants is limited to the Pemerihan Resort, and the small number of tame elephants is needed by the local community in preventing or expelling wild elephants from destroying plantation crops.

There are voluntary parties such as ERU (Elephant Responsive Unit) then there is also WCS (Wildlife Conservation Society) and WWF (World Wide Fund for Nature) which also help in mitigating elephant disturbances around the Pemerihan area.



Figure 9. Routine patrol activities carried out by the Elephant Responsive Unit at the Pemerihan Resort

Mitigation in Social Forms

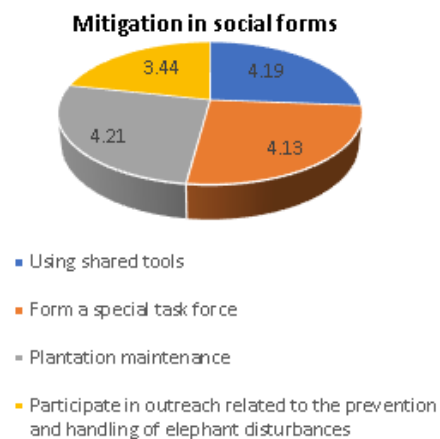


Figure 10. Mitigation in Social Forms

Mitigation of elephant disturbance in a social form in Pemerihan Village using tools that are used jointly by the community agrees at (4.19) or 83.84%. The tools used by the Pemerihan Village community are large flashlights, kentongan, jeduman, or spirit cannons, and wear personal protection when elephant patrols.

Due to the geographical location of Pemerihan Village which is directly adjacent to the Bukit Barisan Selatan National Park area, the community has formed a special task force or task force with an average approval rate of (4.13) or 82.69%. The task force is chaired by Mr. Warsono, the task of this task force is to herd wild elephants back into their habitat to minimize losses due to the arrival of these wild elephants.

With the formation of the task force, it is expected to minimize losses due to disturbances by wild elephants. The special task force owned by Pemerihan Village is 10 people divided into each hamlet or stakeholders. When there is information from the WCS (Wildlife Conservation

Society) regarding elephant movements, the Pemerihan Village task force immediately provides information to each member of the special task force in each stakeholder or hamlet to then coordinate communities who own land around the Bukit Barisan Selatan National Park area to be ready with various tools which are used in preventing wild elephants from destroying community plantation crops.



Figure 11. The Special Task Force for elephant disturbance mitigation in Pemerihan Village

Mitigation of elephant disturbance in a social form carried out by the Pemerihan Village community, one of which is by taking care of plantation crops at night which states that the average agreement is (4.21) or 84.23%. This is done to prevent plantation crops from being damaged or eaten by elephants. Land guarding through monitoring towers is usually carried out by people who have gardens or fields that are often damaged by elephants.

Usually, people leave to guard their plantations at 17.00 WIB and return home at 05.30 WIB. The community will guard and defend their agricultural land from attacks by wild animals including elephants. The effectiveness of efforts to deal with elephant conflicts can be seen from the success of the community in expelling or blocking the arrival of elephants so that the elephants leave.

Monitoring through monitoring towers is more effective, because the community has awareness of plantation crops that are close to the area, if you want to have a successful harvest, you must be prepared to guard plantation crops.



Figure 12. Guarding community plantation crops in Pemerihan Village at night

Meanwhile, following socialization related to the prevention and handling of elephant disturbances, the community stated that the average doubt was (3.44) or 68.4%. Dissemination related to the prevention and handling of elephant disturbances has often been carried out by related agencies but the results are not so significant in overcoming elephant disturbances the level of disturbance has decreased from what usually reaches 6 times a month to 1 time before elephant disturbances enter plantations public. So that the losses incurred by the community are not so large compared to before.

To produce maximum results from mitigating elephant disturbances, support, open cooperation, and active participation are needed from the people involved in the conflict, district governments, related agencies, and non-governmental organizations concerned with tackling human-elephant conflicts. Then efforts are needed to increase public understanding of elephant protection and the socialization of elephant conflict management can provide a process of changing behavior, knowledge, attitudes, and skills within farming communities in conflict areas. So

that the community is aware of and avoids the potential for conflict between elephants and humans.

CONCLUSION

Based on the results of research on the Mitigation of Elephant Disturbance in Pemerihan Village, Bengkunt Subdistrict, Pesisir Barat Regency, three ways were found, namely first, mitigation of elephant disturbance in physical form carried out by the community in Pemerihan Village was by building a guard tower, using a large flashlight or a large flashlight and shooting firecrackers towards the elephant. Second, mitigation of elephant disturbance in a biological form carried out by the people of Pemerihan Village by making noise, rearing honey bees or glancing bees on the paths traversed by elephants and together with the ERU (Elephant Responsive Unit) driving away wild elephants using tame elephants. Third, mitigating elephant disturbance in a social form carried out by the community in Pemerihan Village is using tools that are used together to drive away elephants, forming a special task force (Satgas) to keep elephants from entering plantations and guarding plantations together.

REFERENCES

- Berliani, K., Alikodra, H. S., Masy'ud, B., & Kusriani, M. D. (2022). Upaya dan peran serta masyarakat dalam menanggulangi konflik manusia-gajah (*Elephas maximus sumatranus*) di Provinsi Aceh. *In Prosiding Seminar Nasional Biotik* 4(1).
- Chong, D. K. F., & Norwana, A. A. B. D. (2005). *Guidelines on the better management practices for the mitigation and management of human-elephant conflict in and around oil-palm plantations in Indonesia and Malaysia*. WWF-Malaysia, Petaling Jaya.
- Departemen Kehutanan. (2007). *Strategi dan Rencana Aksi Konservasi Gajah Sumatera dan Gajah Kalimantan 2007-2017*. Dirjen PHKA. Departemen Kehutanan. Jakarta.
- Enukwa, E. H. (2017). Human-Elephant conflict mitigation methods: A review of effectiveness and sustainability. *Journal of Wildlife and Biodiversity*, 1(2), 69-78.
- Fernando, P., Kumar, M. A., Williams, A. C., Wikkamanayake, E., Aziz, T., & Singh, S. M. (2008). *Review of human-elephant conflict mitigation measures practiced in South Asia* (pp. 19-20). Gland, Switzerland: WWF.
- Hidayat, W., Abdullah, Khairil. (2018). Estimasi populasi gajah sumatera (*Elephas maximus sumatranus*) berdasarkan metode defekasi di kawasan Hutan Peneuron Kabupaten Aceh Timur. *Jurnal EduBio Tropika*. 6(1): 35-40.
- Ogra, M., & Badola, R. (2008). Compensating human-wildlife conflict in protected area communities: ground-level perspectives from Uttarakhand, India. *Human Ecology*, 36, 717-729.
- Pratiwi, P. (2021). *Pengelolaan Konflik Manusia Dengan Gajah Di Taman Nasional Bukit Barisan Selatan*. Skripsi. Tidak di Terbitkan. Fakultas Pertanian. Universitas Lampung : Bandar Lampung.
- Purnanuriski, L., Darmawan, A., Winarno, G. D., Febryano, I. G., Ismanto, I., & Sugiharti, T. (2022). Analisis Mitigasi Konflik Gajah Sumatera (*Elephas Maximus Sumatranus*, Temmick 1874) Di Taman Nasional Bukit Barisan Selatan. *Jurnal Belantara*, 5(2), 178-190.
- Rianti, A., & Garsetiasih, R. (2017). Persepsi masyarakat terhadap gangguan gajah sumatera (*Elephas maximus sumatranus*) di Kabupaten Ogan Komering Ilir. *Jurnal Penelitian Sosial dan Ekonomi Kehutanan*, 14(2), 83-99.
- Yoza, D. (2016). *Teknik-Teknik Mitigasi Konflik Gajah Manusia Di Provinsi Riau*.