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## PERCEPTIONS ON THE SUMATRAN RHINOCEROS CONSERVATION IN MALAYSIA

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### ABSTRACT

The Sumatran Rhinoceros (*Dicerorhinus sumatrensis*) once inhabits the tropical rainforest of Malaysia. Sadly, this shy and cryptic mammal had become locally extinct in 2019. This paper aims to document, understand, and contextualise the perception of the Sumatran Rhinoceros in the mega biodiversity environment. The survey was conducted using a standard structured questionnaire survey. Data analysis was performed using descriptive analysis. The results show that the respondents consisted of highly informed groups with high awareness of the Sumatran Rhinoceros that want active participation in working with relevant authorities to conserve our wildlife. The highest consensus for the lesson learnt from the extinction of the Sumatran Rhinoceros in Malaysia was to increase awareness amongst Malaysian from all fronts. The way forward to address this issue is to significantly increase outreach programmes to schools and communities. The co-management of our biodiversity with all stakeholders is needed. Empowerment of the public in Malaysia is needed to help sustainable funding of the conservation program in Malaysia.

**Keywords:** Biodiversity, extinction, awareness, citizen science, co-management.

### INTRODUCTION

In evolution, species extinction is a fundamental component of the process (Kathirithamby-Wells, 2005). This process happens gradually over a long period through natural selection. However, humans are rapidly changing the natural ecosystem at the landscape level. Many species, including mammals, are fast disappearing in the wild (Atwood *et al.*, 2020). The Sumatran Rhinoceros (*Dicerorhinus sumatrensis*) is also one of the mammal species that tragically reduced to a dwindling population due to us (Figure 1). The majestic creature once inhabits the forest throughout Southeast Asia extending from Burma, Thailand, Peninsular Malaysia, Sumatra, and Borneo island (Groves & Kurt, 1972). Today's only known wild population persists in a small and isolated population in Sumatra and Kalimantan (Dunham, 2021).



**Figure 1:** Sumatran Rhinoceros bathing at a wallow (Photo credit: Mohd Samsudin Mohd Suri, PERHILITAN)

Sumatran Rhinoceros (Figure 2) is the smallest species of Rhinoceros that measures from 1.2-1.4 m at shoulder height (Groves & Kurt, 1972; Payne *et al.*, 1985). This species is also known as the ‘woolly’ Rhinoceros because it has the most hair of all living Rhinoceros. It has two horns at its snout. The posterior horn is the biggest, measuring up to 19 cm in adult males, while the anterior horn grows up to 7.6 cm (Payne *et al.*, 1985). The facial skin is wrinkled around its eyes (Groves & Kurt, 1972).



**Figure 2:** The Sumatran Rhinoceros at Sungai Dusun Wildlife Conservation Centre. (Photo credit: Rahmat Topani, PERHILITAN).

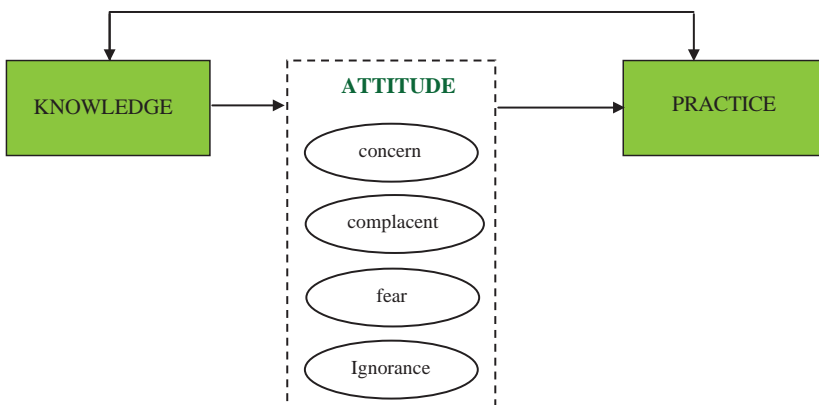
The Sumatran Rhinoceros is a solitary mammal by nature except when it is still within the care of its mother (Hubback, 1939). This species inhabits a wide range of habitats ranging from the steep mountainous area to the lowland forest (van Strien, 1986). Its home range was reported from 10 to 30 km square (Strickland, 1967; van Strien, 1986). This species is listed as critically

endangered in IUCN RED list (Ellis & Talukdar, 2020). All international trade of the animal is banned under Appendix I of CITES, except for non-commercial conservation reasons. It is a fully protected mammal in Malaysia under the Protection of Wildlife Act 1972 (Peninsular Malaysia), Sarawak Wildlife Protection Ordinance 1998, and Sabah Wildlife Conservation Enactment 1997.

This shy and cryptic mammal has become locally extinct in Malaysia in recent years (Ripple *et al.*, 2016). The last Sumatran Rhinoceros died in Malaysia in November 2019 (Save The Rhinoceros, 2019). This has made Malaysian wildlife researchers and wildlife managers highly affected by it. The incident has drawn substantial international attention to Malaysia again, in terms of protecting our rich biodiversity from eroding. Most of us question, “what actually went wrong?” and “what should have been done to halt the extinction?” Accusations that the Malaysian Government and conservation institutions were not caring enough and not doing enough for the species were questioned. The purpose of this paper is to document, understand and contextualise the perception of the Sumatran Rhinoceros in the mega biodiversity environment.

The Sumatran Rhinoceros used to be distributed in the wild in Peninsular Malaysia, Sarawak and Sabah. In Peninsular Malaysia, the Sumatran Rhinoceros was once distributed widely from the south to the northern states (Flynn & Abdullah, 1984). In the early 1980s, it was estimated that about 125 individuals of Sumatran Rhinoceros in Malaysia and Sarawak were believed to have been locally extinct (Boonratana, 1997). To date, there is no wild population in Malaysia (Ripple *et al.*, 2016; Suri, 2020).

The fundamental approach of this article is based on the KAP conceptual framework (Figure 3). The three aspects, i.e., knowledge, attitude, and practice, govern an individual’s behaviour (De Pretto, 2015). A KAP survey helps us identify gaps that may be present in one or all of these three aspects that are triggering the problem we have at hand. In this conceptual framework, the amount of knowledge accumulated will govern an individual’s attitude and practice (Delgado-Hernández, 2021). As shown in the diagram, knowledge can directly or indirectly affect an individual’s practice (behavioural pattern). Attitude can be expressed in several dimensions, but for this study, we primarily measure the concern from the respondents. The study was designed based on this theory that dictated the objectives of this study.



**Figure 3:** KAP Conceptual Framework

## Objectives

There are basically three objectives in this study. These objectives are as follows:

1. To measure the level of knowledge and attitude of the Malaysian respondents about Sumatran Rhinoceros.
2. To measure the respondent willingness to assist relevant institutions in Malaysia to conserve biodiversity.
3. To document the lessons learnt from respondents on the extinction of Sumatran Rhinoceros.

## Study Approach

The focus of the study is on Malaysian citizens. As such, the respondent from all over Malaysia and Malaysian staying overseas were targeted for the survey. The survey was conducted using a standard structured questionnaire survey as in appendix 1. There were two parts of the survey questions, i.e., the first part on the demographic information. The second part was on the perception of the respondent on Sumatran Rhinoceros. Demographic information collected were gender, occupation, the residential state in Malaysia, and age. The age was categorised into two, i.e., below 40 years and 40 years and above. It was designed in this manner to avoid encumbrance for the respondents.

The questionnaires on the perception of the respondents consisted of four components. These components were knowledge, awareness, practice, and lesson learnt. Except for the lesson learnt component, all the questions were dichotomous with a simple YES or NO answer choice. For the lesson learnt component, respondents were asked to state two lessons learnt from the Sumatran Rhinoceros extinction in Malaysia.

In this study, knowledge refers to how well they know about Sumatran Rhinoceros. This was simply reflected through two questions, i.e., whether they know that the species is not found globally distributed widely in the wild. The second question was “Does extinction of Sumatran Rhinoceros impact on Malaysian biodiversity?”. As for attitude, this refers to the level of respondent concern for the species. Two questions used were “Sumatran Rhinoceros is of no concern to me” and “Malaysian biodiversity is still biodiverse without Sumatran Rhinoceros”. The component of practice refers to how willing the respondent can assist the relevant institution in conserving Malaysian biodiversity. The questionnaire survey (Appendix 1) was uploaded in the google survey form and was distributed through social media especially, WhatsApp. The google form survey was initiated on 19 June 2021 until 10 July 2021. The survey targeted only Malaysian respondents that lasted for three weeks.

The data was analysed using descriptive analysis. The results were presented in percentages to answer objectives one and two. For objective three, an add-in software in Microsoft words known as Word Cloud was used to analyse the most common terms used by the respondents. The setting used for Word Cloud was an intelligent case, with 120 maximum words, and common words were removed. All the written responses were analysed to see any common groups. The responses were categorised mainly into three groups, i.e., awareness (knowledge), concern (attitude), and practice. The results were presented visually to detect the consensus of Malaysians regarding what they learn from the extinction of the Sumatran Rhinoceros.

## Results and Discussion

Based on 402 respondents that participated in the study (Table 1), the number of female respondents was higher (58.9%) than males (41.1%). The respondent age below 40 years dominated by 65.7%, while the respondent aged 40 and above was only 34.3%. Most of the respondents were from Sabah (44.3%) and Peninsular Malaysia (43.5%). Some were from Sarawak (9.7%) and overseas (2.5%). In terms of occupation, the students dominated with 40.5%, followed by no occupation (20.4%), Administrator (17.9%), Researcher (13.9%), and NGO (7.2%).

**Table 1:** Demographic information of respondents.

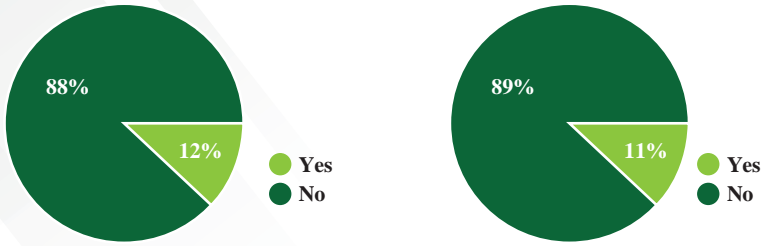
Parameters		#	Percentage (%)
Gender	Male	165	41.1
	Female	237	58.9
Age	Below 40 years	264	65.7
	40 years and above	138	34.3
Occupation	Student	163	40.5
	None	82	20.4
	Administrator	72	17.9
	Researcher	56	13.9
Residency	NGO	29	7.2
	Sabah	178	44.3
	Peninsular Malaysia	175	43.5
	Sarawak	39	9.7
	Overseas	10	2.5

Currently, the Malaysian population is 32,782,854 people (World Population Review, 2021). The 2018 census of eligible voters in Malaysian is 14,940,624 (Election Guide, 2018). There are only 7,820,600 Malaysian that uses social media platform (MCMC, 2019). This means that our sample is only 0.005 per cent of the Malaysian that is accessible. We do realise that the sample of respondents might be too small to represent the whole nation. Nevertheless, we proceed to presents the results of the respondent on the issue due to its urgency. It needs to be brought forward to the Malaysian public and to chart the way forward to address the issue.

#### ***Respondents' knowledge***

The respondents' response regarding Sumatran Rhinoceros (Figure 4) shows that the respondents have a high level of knowledge of Sumatran Rhinoceros. A high number of respondents know that the species is not widely distributed worldwide (88%). It was true also for knowledge that there is an impact on the forest due to the species extinction. 89% agreed that our forest had an impact when we lost our Sumatran Rhinoceros wild population. The results derived from those two questions indicate that Malaysian respondents have good knowledge (88.5%) of Sumatran Rhinoceros.

All of the respondents are educated and are internet savvy. Presumably, they are exposed to the information of the Sumatran Rhinoceros through the newspaper, or online news gathered from the internet. 40% of the respondents were students, meaning that our students are well informed and exposed to the report of Sumatran Rhinoceros.

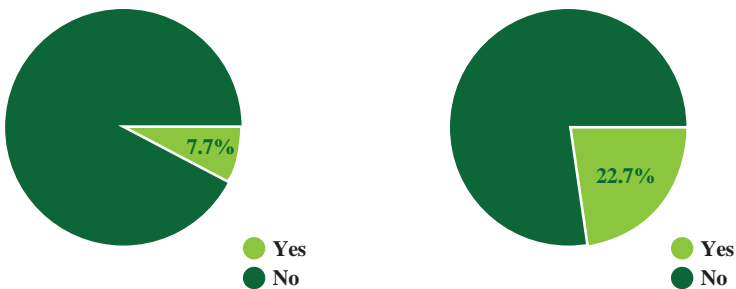


**Figure 4:** (A) The respondent’s knowledge on the distribution of Sumatran Rhinoceros in the world, (B) The respondent’s knowledge on the impact of Sumatran Rhinoceros extinction on the forest.

**Respondents Attitude**

The respondents’ responses regarding their level of concern of Sumatran Rhinoceros are shown in Figure 5. A very high number of the respondents attest that the extinction of the Sumatran rhino is of their concern (92.3%). 77.3% agreed that Malaysian is no longer as biodiverse because it has lost Sumatran rhino in the wild. The overall results derived from those two questions indicates that Malaysian have high level of concern (84.4%) of Sumatran Rhinoceros.

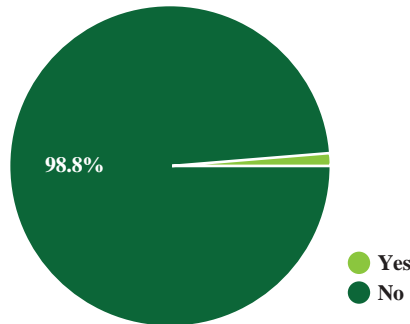
Nevertheless, it is a surprising finding (Figure 5B) that 22.7% perceives that Malaysia is still biodiverse enough without the Sumatran Rhinoceros. This may be because Malaysia is the 12<sup>th</sup> Megadiverse in the world. Our country is blessed with vibrant flora and fauna estimated to be 120 million years of age. The diversity of wildlife alone boasts 303 species of mammals, with more than 785 bird species, 567 reptiles and 242 species of amphibians (Abdul Kadir, 2020). Due to this diversity alone, we are sometimes deluded that losing one or two species is okay.



**Figure 5:** (A) The Respondents concern about the extinction of the Sumatran Rhinoceros. (B) Respondent’s perception of the biodiversity of Malaysia without Sumatran Rhinoceros.

We lose sight of what is more important. Thus, invites this looming danger that we are still biodiverse even though we lost a few species. This act is, in actual fact, taking our biodiversity too much for granted. However, the more species we lose will make our environment less resilient, leading to the fragility of our surrounding ecosystems that supports our very life. The Rhinoceroses eat large fruits and potentially move more than 10 km within plausible gut-passage time (Corlett, 2010). This means that without Sumatran Rhinoceros, large seeds will not be dispersed widely from the mother tree that eventually will adversely affect the resiliencies of our forest (Abdullah, 2016). The lack of concern attitude undermines the sustainability of our forest biodiversity. We need to learn from our past mistakes to be more concerned about our forest environment to prevent it from being destroyed as we solely depend on it to survive. The Sumatran Rhinoceros, as megafauna, provided essential ecosystem services for us as ecological engineers (Ripple *et al.*, 2016).

The results on the respondent's willingness to help relevant authorities for biodiversity conservation (Figure 6) shows that 98.8% were willing to assist in this, and only 1.2% opposed. This finding reflects the high level of responsibility regarding public practice or involvement in conserving our wildlife.



**Figure 6:** Respondent willingness to assist the relevant authority to conserve biodiversity.

#### ***Lesson learnt by Malaysian through the extinction of Sumatran Rhinoceros***

The respondents' results regarding the lesson learnt from the extinction of the Sumatran Rhinoceros were various. It ranges very widely from the lack of financial budget, political will, lack of concerted effort, public concern and so forth. Further analysis from the responses show that the consensus amongst the Malaysian respondents primarily boils down to three reasons why Sumatran Rhinoceros went extinct in the wild. These were the lack of awareness (or knowledge), lack of practice, and lack of concern (or attitude) amongst Malaysians (Figure 7). Saving the Sumatran Rhinoceros was simply not important enough amongst Malaysian denizens due to low wildlife conservation awareness. In 1995, Rabinowitz commented in his polemic article that the Sumatran Rhinoceros in Malaysia was quickly disappearing because the Malaysian Government does not see the urgency of the problem. This was further embroiled with the tactlessness of international funding agencies (Rabinowitz, 1995).



**Figure 7:** The most common comment by the respondents is lack of awareness (knowledge), followed by lack of practice and concern (attitude).

The results indicate that we need more awareness amongst Malaysians to conserve the remaining biodiversity in our country. Good practice can be executed with the acquisition of the related knowledge. Last time, wildlife conservation concerns only amongst a selected few. Now, biodiversity conservation is everyone’s concern because it affects our livelihood and wellbeing. As such, we should not solely depend on conservationists. Everyone in Malaysia has a role to play in ensuring that our biodiversity is conserved.

The wildlife act that we have now were developed from our colonial masters. We already have our wildlife protection law in the 1960s and the protected areas soon after the independence of Malaysia in 1963. The awareness and knowledge of wildlife conservation were in their infancy in the 1960s. Efforts to send staff from relevant authorities were made in the 1970s to increase the awareness of wildlife conservation and protection. Only in the 1980s did the Malaysian public awareness of wildlife have been instilled (Abdul Kadir, 2020). The Malaysian awareness of wildlife has increased since then. Nevertheless, the extinction of Sumatran Rhinoceros (Figure 8) clearly indicates that we need to do more to care for wildlife conservation in Malaysia.





**Figure 8:** Tam, the male Sumatran Rhinoceros in September 2018 (Photo credits: Mohd Samsudin Mohd Suri, PERHILITAN).

## CONCLUSION

The respondents consisted of highly informed groups with high awareness of the Sumatran Rhinoceros. They also want to have active participation in working with relevant authorities to conserve our wildlife. The highest consensus for the lesson learnt from the extinction of the Sumatran Rhinoceros in Malaysia was to increase awareness amongst Malaysian from all fronts. This was followed by an increase in wildlife enforcement and management. Lastly, to improve the level of concern amongst Malaysians.

The way forward to address this awareness issue is to significantly increase outreach programmes to schools and communities. In addition to that, we need to promote and practice citizen science. This will increase the level of participation amongst Malaysians to conserve our biodiversity. At the same time, it will empower them. The co-management of our biodiversity with all stakeholders is needed to protect our invaluable Malaysian wildlife. They should not only be seen as a resource for us to exploit but an entity to be respected. We know that science without a heart is dangerous that lead us to our own demise. Empowerment of the public in Malaysia is needed to help sustainable funding of the wildlife conservation program in Malaysia.

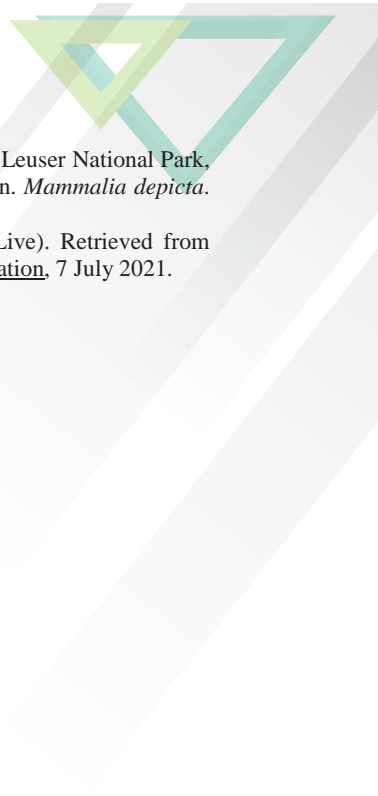
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