

# Hunting of wild animals by Saubeba Community in Manokwari, West Papua, Indonesia

SAREMAY SAWAKI<sup>1,✉</sup>, DENISA TARAN<sup>2,✉✉</sup>, FRANSISKUS TARAN<sup>2</sup>, ROBI BOMOI<sup>2</sup>, MARSIA RUMATERAY<sup>2</sup>

<sup>1</sup>Department of Community and Village Development of West Papua Province. Jl. Jend.Purn. Abraham O. Atururi, Kompleks Perkantoran Arfai, Manokwari 98312, West Papua, Indonesia. Tel./fax.: +62-986-211719, ✉email: saremayawaki@gmail.com

<sup>2</sup>Department of Forestry, Faculty of Forestry, Universitas Papua. Jl. Gunung Salju Amban, Manokwari 98312, West Papua, Indonesia. ✉✉email: denisataran14@gmail.com

Manuscript received: 2 February 2022. Revision accepted: 21 April 2022.

**Abstract.** *Sawaki S, Taran D, Taran F, Bomo R, Rumateray M. 2022. Hunting of wild animals by Saubeba Community in Manokwari, West Papua, Indonesia. Biodiversitas 23: 2411-2416.* Hunting is a way to harvest wild animals from nature and it is still a common practice by local communities in Papua, Indonesia. This study aims to investigate traditional ecological knowledge of hunting wild animals by Saubeba community in Manokwari, West Papua, Indonesia. The data was collected through open interviews to 32 respondents determined using the snowball sampling technique. The result showed that hunting is performed in a group of 4-8 members when the dark moon happens. A group of hunters consists of adult men and teenage boys aged above 15 years old. They hunt 3-4 times per month with a duration of 2-3 days in the forest. Modern hunting is carried out using weapons, while traditional hunting is performed with the help of dogs, used arrows, spears and snares. Women are not allowed to hunt and they are prohibited to touch all hunting equipment and the catches. Among the wild animals hunted, nine out of sixteen species are categorized as protected animals and some of them have high conservation concerns in the International Union for Conservation of Nature (IUCN) Red List and Convention on International Trades on Endangered Species (CITES) list. No conservation efforts are planned and applied by the hunters and the community. However, there is a shift in the diet, in which eleven respondents stop hunting and start to raise livestock for consumption purposes. This suggests that assistance in livestock rearing programs by government is required to reduce the hunting pressure on the remaining wild animals.

**Keywords:** Ethnozoology, local wisdom, vogelkop, wild meat

## INTRODUCTION

Biodiversity richness of Papua New Guinea is the second-largest in the world. It has enormous biodiversity with a high level of endemism. This place has the richest vascular plant species in the world, standing at 13,634 species (Camara-Leret et al. 2020). In terms of animal biodiversity, this island consists of 475 species of mammals, 562 species of Reptiles and Amphibians, 1130 species of birds, 5850 species of fish, and thousands of invertebrate species (Kartikasari et al. 2012). Papua, which refers to the west side of the island, has 50% of the total biological richness in Indonesia, a country recognized as one of the "mega biodiversity countries" (Marshall and Beehler 2011). These natural resources have been used by the community to meet the needs of daily life for generations.

The regulation in using wild animals is formulated in the law of the Republic of Indonesia. The law of the Republic of Indonesia Number 41, 2014 states that wild animals are all animals that live on land, water and air that still have wild characteristics, both those that live freely in nature and those that are kept by humans. Furthermore, the Regulation of the Republic of Indonesia Number 13 in 1994 states that hunting is everything related to hunt while the hunt is catching and/or killing hunted animals, including taking or moving eggs and/or nests of hunted

animals. Hunted animals are certain species of wild animals that are set to be hunted, generally, animals that are not protected by law. In meeting the family's protein needs, Papuan communities still consume bush meat (Pattiselanno et al. 2019).

Hunting has been carried out mainly by people who live around the forest and coastal areas and it has become a hereditary activity. In this modern era, there are still many tribes in Papua whose lives still depend on hunting because they are facing various difficulties to access farmed meat. However, hunting is not easy work. People who do hunting must know effective and efficient hunting strategies to obtain wild animals so that the catches are sufficient to meet household needs. Hunters must have adequate knowledge of the biology and ecology of wild animals (Alves et al. 2009). Hunting strategies can be varied between tribes and communities. It has been developed over a long period of time and adapted to the changes in the wild animal populations and environmental conditions (Ross et al. 1978).

Research conducted by Fatem et al. (2014) discovered that there are 11 species of wild animals that are hunted and used as a source of protein, trading, medication and jewelry in three villages in North Manokwari Sub-district, namely Pami, Nuni and Inoduas. This study showed that hunting and utilization of wild animals in this area is still actively carried out. However, there is no explanation

regarding the conservation efforts of the wild animals hunted. Furthermore, Rumengan (2017) found that to avoid excessive hunting of wild animals, the community of Isenebuai Village, Teluk Wondama District imposed *Sawora* at the hunting location, which is a customary rule to not take certain wild animals at the hunting location within a certain period of time and it must be obeyed by all people who live and come to the village. Thus, there is a balance between utilization and conservation effort that will result in sustainable use.

Hunting of wild animals is one of the reasons that underlie the decrease in wild animal populations (Aiyadurai et al. 2010). Although it is a way to maintain life, continuous and excessive hunting without the absence of conservation programs can lead to the population decline of wild animals as prey species (Rija et al. 2020). This study aims to investigate the traditional ecological knowledge of hunting wild animals by Saubeba community in North Manokwari Sub-district, Manokwari District, West Papua Province, Indonesia. It is essential to have a better understanding of the hunting practice and add new information on the ethnoecology of wild animal hunting by Saubeba community so that the result can be used to predict its impact on wild animals and also can be used by local governments as basic data for formulating regulations for hunting activities while still implementing sustainable wild animal utilization.

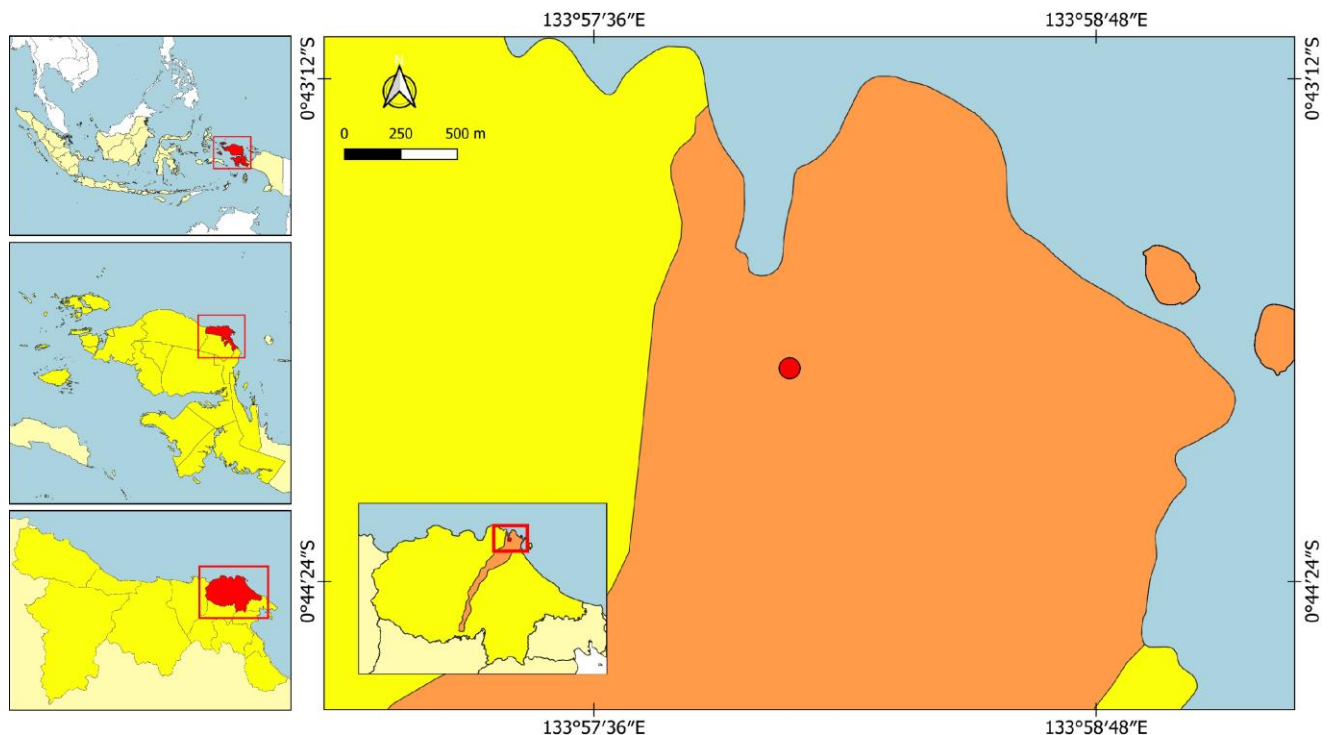
## MATERIALS AND METHODS

### Study site

This research was conducted in Saubeba Village. It is located in North Manokwari Sub-district, Manokwari District, West Papua Province, Indonesia (Figure 1). The national code of the village is 92.02.14.2008. This area is situated in bird head seascape or known as *Vogelkop* (*kepala burung*). This village is in a coastal area and directly adjacent to a lowland forest. The community is dominated by the Sough tribe, a native tribe to Arfak Mountain. The other minority groups are from Serui, Biak, East Nusa Tenggara and Java. The people's occupations are farmer, hunter, fisherman and civil servant.

### Data collection

The administration process of the research and the collection of the data was undertaken for three weeks, from 12th November to 3rd December 2021. This research used qualitative and descriptive methods. The data was collected through an open interview that refers to the questionnaire that has been created. The snowball sampling technique was applied to determine the respondents. The interview was conducted with all communities that carry out hunting activities. There were 32 respondents interviewed from 85 adult men in this community, of which twenty-one respondents are still actively hunting, whereas eleven respondents are former hunters. Data were analyzed descriptively and displayed in the form of tables and figures. Contextual approach was used to explain the situation in the field in order to complete a description of the study sites.



**Figure 1.** The location of Saubeba Village, North Manokwari Sub-district, Manokwari District, West Papua, Indonesia

## RESULTS AND DISCUSSION

### Traditional ecological knowledge of hunting by Saubeba community

Interviews reveal that all the respondents do not have knowledge related to hunting laws and regulations set up by the government and they do not formulate any conservation programs for the prey species in their hunting ground. Hunting activity is largely driven by the needs of household consumption, medication and generating income by trading the catches. As experience increases, hunters will have the knowledge to recognize wild animal species, wild animal biology and ecology, read natural phenomena and the strategy to effectively and efficiently murder the wild animal (Shaffer et al. 2017). This knowledge is a valuable patrimony and it has become part of local wisdom (De Souza and Alves 2014). The traditional ecological knowledge of hunting in Saubeba community is explained below to provide information regarding the hunting group, hunting time and location, hunting method, wild animal and the form of utilization, hunting taboo, and conservation of wild animals utilized.

#### *Hunting group*

Hunting was performed in a group consisting of 4-8 people. Group members are neighbors and also relatives from the surrounding villages. They are suggested to hunt together to strengthen the brotherhood. Group member consists of adult men and teenage boys aged 15 years old and above. Adolescent boys are included to inherit knowledge. Hunting is a labor-intensive attempt, so hunting in groups facilitates the process of chasing, catching and also bringing the catches. The long journey and rugged terrain are also reasons why hunting cannot be undertaken individually. The catches will be divided equally among all group members. In certain events, when there are celebrations in the village, such as Christmas and Easter, all the villagers will gather and the heads of the families who have been selected will share tasks and carry out hunting collectively. The catches will be cooked and consumed together.

#### *Hunting time and tenure*

Hunting is not carried out as daily activity. Hunters must take into account body conditions, environmental conditions and the presence of wild animals. Commonly, hunters perform hunting 3-4 times/month and they have to stay 2-3 days in the forest. All respondents hunt during the dark moon or the new moon. At this time, the moon is not visible on earth because the part of the moon that faces the earth is not exposed to the sunlight (Preston et al. 2019). In dark forest conditions, more wild animals are active. This is an ideal condition for hunters to catch wild animals (De Souza and Alves 2014). To start hunting, the group of hunters will gather and pray together. They will then walk from the village to the designated place as a base with a distance of around 2-3 kilometers. They have to expand the hunting ground over time. They hunt by exploring the lowland forests in the North Manokwari to the Prafi plain. Hunting locations are usually in primary forest, secondary

forest and around the watershed. Hunting locations are based on the habitat of the targeted wild animals.

#### *Hunting method*

The respondents develop hunting methods and strategies depending on their knowledge about wild animals, the environmental conditions of the hunting grounds and all resources they have. The hunting strategies used by the respondents are waiting at locations frequented by wild animals and walking and searching for wild animals. Hunters acknowledge two hunting methods, namely modern and traditional. Modern hunting is performed using blow weapons. Meanwhile, traditional hunting is undertaken with the help of dogs, using arrows and spears and by setting snares.

Hunting with a weapon was only carried out by two respondents. They have to spend around IDR 3-6 million for a blow weapon. The price is very expensive, which is why most respondents choose to hunt traditionally. The users must be able to point the weapon to shoot right at the targeted wild animals. It can be used to kill all species of wild animals. Hunting using weapons establishes a convenient process of hunting wild animals. For comparison, when using weapons, the birds caught are up to 20 birds. Meanwhile, only about 5-10 birds were obtained with the use of arrows. Therefore, it is necessary to tighten the use of a weapon because the number of wild animals being hunted has increased dramatically with the use of this equipment. This means that wild animal populations are increasingly threatened.

All respondents hunted with the help of dogs. Without the dog, the hunter faces significant difficulty to find wild animals. A dog has a sensitive sense of hearing and smelling and can run fast so that they can help people to find and catch wild animals (Lupo 2011). The dogs catch the wild animal by biting until the animal is weak or even killed. The respondents generally bring 3-5 dogs when hunting. Although hunting is performed in groups, only one person brings his dogs. The dogs are not specially trained. However, the dog owner will give a secret potion to be consumed by the dog and the dog will be directly involved in the hunting activity.

Most respondents preferred to hunt traditionally by using arrows, spears, and setting snares. This is because the materials used are accessible freely. For example, to produce bows, arrows and spears, the hunters need wood, reed and bamboo, which are widely available in the forest around the village. Hunting using arrows and spears is a hunting process that relies on the strength of the hunter. Hunters must move rapidly and take into account the distance between hunters and wild animals so that when arrows and spears are thrown, they can directly stab to murder the wild animals. Meanwhile, hunting with a snare is categorized as passive hunting because it does not expend a lot of energy and there is no direct contact with wild animals. Hunting by setting snares is mostly performed by teenagers and children who are just starting to learn hunting. The snare is traditionally built using rope and wood designed to bind the legs and hang wild animals until released by the installer.

### Hunting taboo

Taboo is a social prohibition against words, objects and or actions that are not desired by a community or ethnic group. It is a public belief that is passed down orally and, if violated, will cause accidents or bad matters (Widiastuti 2015). The hunting taboo in Saubeba Village is related to women. Women are not allowed to hunt and they cannot touch all the equipment that will be used to hunt. When the catches are cleaned, the woman must not be exposed to the blood and washing water of the animal. This prohibition applies to all people in Saubeba Village and others from outside. If these taboos are violated, the woman will experience prolonged pain until she realizes the mistakes and apologize to the owner of the equipment and or catches. After that, the woman will recover. Women are only allowed to cook and/or trade the catches.

### Hunting target and the form of utilization

There are 16 species of hunting targets. They are being utilized by the people in Saubeba Village for various purposes (Table 1). The wild animals caught varied every time the respondents carried out the hunting activity. Once the respondents hunt, they will catch a wide variety of wild animals, ranging from 4 to 6 wild animal species. The most popular catch of wild animals by all respondents are deer and wild boars. Every time they hunt, they will try to catch these two animals first. There are wild animals that are very common and always available, there are wild animals that can only be obtained in certain seasons and there are wild animals that hard to find and or no longer be found.

The data in Table 1 shows that the most common form of utilization is consumption. Hunting is undertaken only to meet household needs. However, if the catch is excessive, it will be sold. Wild animals that are often being hunted and purchased are *Rusa timorensis* and *Sus papuensis*. This is because the animals have a large body size, so some of the meat will be consumed and some will be traded. The wild animals will be purchased by the middleman. The use of wild animals for customary needs and pet were not found in this study. The hunters categorize *Chelonia mydas* dan *Eretmochelys imbricata* as terrestrial hunting because they hunt these two animals when they come to the coastal area for lay their eggs.

### Conservation status of target animals

The utilization of target animals must be accompanied by conservation efforts so that the use is sustainable. However, the respondents stated that there is no conservation program formulated by the hunters and Saubeba village's community for the target animals. They hunt wild animals that can be utilized based on their purpose. The respondents also argue that they only use what is in nature to fulfill their needs without considering future generations. In addition, the hunters are also not aware of the existence of protected animals and conservation status of target animals. Conservation status of wild animals is created to show the trend of wild animals' population in their habitat globally (Indonesian Government Regulation and IUCN) and also the impact on international trade (CITES). Table 2 shows wild animal

species, the conservation status and the global population trend of the wild animals based on the IUCN' report.

According to the Government Regulation of the Republic of Indonesia Number 13 in 1994, the animals that are allowed to be hunted are those of non-protected animals. However, the data from Table 2 shows that nine of the sixteen species utilized by the community in Saubeba Village are protected animals based on the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.20/MENLHK/SETJEN/KUM.1/6/2018. Moreover, there are three species that have high conservation concerns under IUCN, namely *R. timorensis*, *C. mydas* and *E. imbricata*. Based on the interviews, these species were among the species most hunted by the community. *R. timorensis* is utilized for consumption and trading, while *C. mydas* and *E. imbricata* are used for medication and trading. In addition to this, nine out of sixteen species are listed in CITES. It means that these wild animals are prohibited to be traded or traded with a certain permit. Overall, the population trend globally based on IUCN reports shows that most of the target animals by Saubeba village's community have a declining population trend and some are even unknown. Therefore, it is important for local governments to take action to socialize and impose restrictions or even bans on hunting species that are already on these three lists.

### Conservation versus meeting community needs: What is the option?

Hunting is one of the causes of the decline in wild animal populations. Unsustainable wild animal hunting through excessive catch and continuous hunting without a conservation program can threaten the population (Coad et al. 2013). However, harvesting wild animal is unavoidable because it is a source to fulfill community nutrition. In Saubeba Village, the hunters have easier access to wild meat compared to farmed meat such as chicken, cow and pig, which are generally traded in the main market in Manokwari City. Saubeba Village is  $\pm 1.5$  hours drive from Manokwari City. In addition to this, to consume farmed meat, they have to purchase while wild meat can be obtained freely. Moreover, although the location of the Saubeba Village is in the coastal area, the dominant tribe in this village is the Sough tribe which is categorized as a forest-dwelling tribe, so they prefer to hunt rather than catch fish in the sea.

Hunting for wild animals has been actively carried out since the establishment of the village. Based on the communication with Mr. Andi Bomo, the head of the village, the Saubeba Village was set up based on a government decree in 2008. However, this village has been around since 1985. Over time, due to the development and the population growth, demand for wild animals is increasing. This condition is further exacerbated by the use of weapons and the presence of hunters from outside the village. Currently, there are no publications regarding the number of wild animal populations in the North Manokwari Sub-district. However, the respondent's statement that there are no conservation efforts for wild

animals utilized and it is increasingly hard to find wild animals in the forest around the village so they have to expand their hunting areas has suggested that the wildlife population has decreased.

Raising livestock continues to be established to meet the protein need of the communities. When the interview was conducted, 11 respondents had stopped hunting and started raising livestock on a household level. They have raised chickens, ducks, pigs and cows. This effort is supported by Animal Husbandry Department of West Papua Province in the form of providing cows to the community. The shift in harvest from wild animals to livestock is expected to be further developed as conservation efforts toward wild animals. The community

can reduce consuming bush meat and start to consume more livestock meat. However, raising livestock is new for the community. Livestock frequently dies due to mistreatment and/or diseases. Therefore, it is hoped that the Provincial Government of West Papua, through the relevant department, can provide support to the community in the form of assistance and socialization of procedures for raising livestock and developing livestock businesses so that people not only raise livestock for household nutritional needs, but also for trading to generate income. Besides that, it is important to formulate regional regulations relate to hunting and strict law enforcement for anyone who violates them.

**Table 1.** Wild animal species and the form of utilization by the community in Saubeba Village, Manokwari District, West Papua Province, Indonesia

Local Name	Scientific name	Class	Form of Utilisation					
			C	T	M	HD	CN	P
Rusa	<i>Rusa timorensis</i>	Mammal	√	√		√		
Babi Hutan	<i>Sus papuensis</i>	Mammal	√	√				
Tikus Tanah	<i>Echymipera rufescens</i>	Mammal	√					
Tikus Tanah	<i>Echymipera kalubu</i>	Mammal	√					
Kuskus	<i>Spiloglossus maculatus</i>	Mammal	√					
Kuskus	<i>Phalanger orientalis</i>	Mammal	√					
Kelelawar	<i>Dobsonia minor</i>	Mammal	√					
Soa-soa	<i>Varanus indicus</i>	Reptile	√					
Penyu	<i>Chelonia mydas</i>	Reptile	√		√			
Penyu	<i>Eretmochelys imbricata</i>	Reptile	√		√			
Burung Mambruk	<i>Goura spp.</i>	Aves	√					
Burung Maleo	<i>Talegalla fuscirostris</i>	Aves	√					
Burung kumkum	<i>Ducula pinon</i>	Aves	√					
Burung taontaon	<i>Rhyticeros plicatus</i>	Aves	√					
Burung Nuri	<i>Eclectus roratus</i>	Aves		√				
Burung Cenderawasih	<i>Paradisaea apoda</i>	Aves		√		√		

Note: C: Consumption; T: Trade; M: Medication; HD: Home Decoration; CN: Customary needs; P: Pet

**Table 2.** Wild animal species utilized by Saubeba community of Manokwari District, West Papua Province, Indonesia, the conservation status and global population trend

Local name	Scientific name	Conservation status			Population trend globally
		Indonesian regulation	IUCN	CITES	
Rusa	<i>Rusa timorensis</i>	Protected	Vulnerable	Not Listed	Decreased
Babi Hutan	<i>Sus papuensis</i>	Unprotected	Least Concern	Not Listed	Unknown
Tikus Tanah	<i>Echymipera rufescens</i>	Unprotected	Least Concern	Not Listed	Decreased
Tikus Tanah	<i>Echymipera kalubu</i>	Unprotected	Least Concern	Not Listed	Stable
Kuskus	<i>Spiloglossus maculatus</i>	Protected	Least Concern	Appendix II	Stable
Kuskus	<i>Phalanger orientalis</i>	Unprotected	Least Concern	Appendix II	Stable
Kelelawar	<i>Dobsonia minor</i>	Unprotected	Least Concern	Not Listed	Unknown
Soa-soa	<i>Varanus indicus</i>	Protected	Least Concern	Appendix II	Unknown
Penyu	<i>Chelonia mydas</i>	Protected	Endangered	Appendix I	Decreased
Penyu	<i>Eretmochelys imbricata</i>	Protected	Critically endangered	Appendix I	Decreased
Burung Mambruk	<i>Goura spp.</i>	Protected	Least Concern	Appendix II	Decreased
Burung Maleo	<i>Talegalla fuscirostris</i>	Protected	Least Concern	Not Listed	Decreased
Burung Kumkum	<i>Ducula pinon</i>	Unprotected	Least Concern	Not Listed	Stable
Burung Taontaon	<i>Rhyticeros plicatus</i>	Unprotected	Least Concern	Appendix II	Decreased
Burung Nuri	<i>Eclectus roratus</i>	Protected	Least Concern	Appendix II	Decreased
Burung Cenderawasih	<i>Paradisaea apoda</i>	Protected	Least Concern	Appendix II	Decreased

In conclusion, hunting is still the main way to fulfill the protein needs of Saubeba community. However, it should be performed based on the principle of conservation so that there is a sustainable use. Based on our findings, the hunters do not know about hunting regulations set up by the government. Therefore, we suggest three recommendations. First, the government can conduct social with the communities in the North Manokwari Sub-district about hunting regulations, particularly for the wild animal hunted, which have high conservation concerns and sustainable hunting practices such as *Sawora*. Second, assistance in livestock rearing programs and developing of livestock businesses by the government are required to reduce the hunting pressure on the remaining wild animals. Hunting is a labor-intensive attempt so that, over time, the community will start to find a convenient way to fulfill protein needs through raising livestock. Third, the government has to tighten the use of weapon. Weapon is a modern tool that can increase the number of wild animals hunted significantly. Therefore, it can threaten the wild animal population.

#### ACKNOWLEDGEMENTS

The authors would like to acknowledge the 32 respondents who allowed the author to write this paper by providing all the information needed. Acknowledgment also goes to the leader of the Village, Andi Bomo, who offered assistance during the collection of the data.

#### REFERENCES

- Aiyadurai A, Singh NJ, Milner-Gulland EJ. 2010. Wildlife hunting by indigenous tribes: A case study from Arunachal Pradesh, north-east India. *Oryx* 44 (4): 564-572. DOI: 10.1017/S0030605309990937.
- Alves RR, Mendonça LE, Confessor MV, Vieira WL, Lopez LC. 2009. Hunting strategies used in the semi-arid region of northeastern Brazil. *J Ethnobiol Ethnomed* 5 (1): 1-16. DOI: 10.1186/1746-4269-5-12.
- Cámara-Leret R, Frodin DG, Adema F, Anderson C, Appelhans MS, Argent G, van Welzen PC. 2020. New Guinea has the world's richest island flora. *Nature* 584 (7822): 579-583. DOI: 10.1038/s41586-020-2549-5.
- Coad L, Schleicher J, Milner-Gulland EJ, Mathews TR, Starkey M, Manica A, Abernethy KA. 2013. Social and ecological change over a decade in a village hunting system, central Gabon. *Conserv Biol* 27 (2): 270-280. DOI: 10.1111/cobi.12012.
- De Souza JB, Alves RRN. 2014. Hunting and wildlife use in an Atlantic Forest remnant of northeastern Brazil. *Trop Conserv Sci* 7 (1): 145-160. DOI: 10.1177%2F194008291400700105.
- Fatem S, Peday MH, Yowei RN. 2014. Ethno-biological notes on the Meyah Tribe from the Northern part of Manokwari, West Papua. *Jurnal Manusia Lingkungan* 21 (1): 121-127. DOI: 10.22146/jml.18520.
- Kartikasari SN, Marshall AJ, Beehler B. 2012. *Ekologi Papua* (No. 6). Yayasan Pustaka Obor Indonesia, Yogyakarta. [Indonesia]
- Lupo KD. 2011. A Dog is for Hunting. *Ethnozooarchaeology: The Present and Past of Human-Animal Relationships*. Oxbow Books, London.
- Marshall AJ, Beehler BM. 2011. *Ecology of Indonesian Papua Part One*. Tuttle Publishing, New York.
- Pattiselanno F, Aputuley JR, Arobaya AY, Koibur JF. 2019. Using wildlife for local livelihood-experiences from the Bird's Head Peninsula, West Papua, Indonesia. *Biodiversitas* 20 (7): 1839-1845. DOI: 10.13057/biodiv/d200708.
- Preston EF, Johnson PJ, Macdonald DW, Loveridge AJ. 2019. Hunting success of lions affected by the moon's phase in a wooded habitat. *Afr J Ecol* 57 (4): 586-594. DOI: 10.1111/aje.12624.
- Rija AA, Critchlow R, Thomas CD, Beale CM. 2020. Global extent and drivers of mammal population declines in protected areas under illegal hunting pressure. *Plos One* 15 (8): e0227163. DOI: 10.1371/journal.pone.0227163.
- Ross EB, Arnott ML, Basso EB, Beckerman S, Carneiro RL, Forbis RG, Wetterstrom WE. 1978. Food Taboos, diet, and hunting strategy: The adaptation to animals in amazon cultural ecology [and Comments and Reply]. *Curr Anthropol* 19 (1): 1-36.
- Rumengan I. 2017. Tempat-tempat sacral dan penerapan Sawora dalam masyarakat kampung Isenebuai di Kawasan Taman Nasional Teluk Cenderawasih. *Sabda: Jurnal Kajian Kebudayaan* 12 (2): 146-154. DOI: 10.14710/sabda.12.2.146-154. [Indonesia]
- Shaffer CA, Milstein MS, Yukuma C, Marawanaru E, Suse P. 2017. Sustainability and comanagement of subsistence hunting in an indigenous reserve in Guyana. *Conserv Biol* 31 (5): 1119-1131. DOI: 10.1111/cobi.12891.
- Widiastuti H. 2015. Pamali dalam kehidupan masyarakat Kecamatan Cigugur Kabupaten Kuningan (Kajian Semiotik dan Etnopedagogi). *Lokabasa* 6 (1): 71-78. DOI: 10.17509/jlb.v6i1.3149. [Indonesia]