

## TURTLES: THE THREATS, THE CONSERVATION PRACTICES AND THE COMMUNITY EXPECTATIONS IN MUBRANI DISTRICT TAMBRAUW REGENCY

### PENYU: ANCAMAN, UPAYA KONSERVASI DAN HARAPAN MASYARAKAT DI DISTRIK MUBRANI KABUPATEN TAMBRAUW

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#### ABSTRAK

Sepanjang daerah pesisir Distrik Mubrani adalah daerah peneluran penyu. Musim peneluran penyu adalah sebanyak satu kali setahun yaitu pada bulan April. Penelitian ini dilakukan dengan tujuan mengidentifikasi ancaman terhadap penyu, upaya konservasi yang dilakukan oleh masyarakat dan harapan masyarakat untuk pengembangan program konservasi yang telah dilaksanakan. Penelitian ini dilakukan di Distrik Mubrani dengan mewawancarai 45 orang di lima kampung yang berada di daerah pesisir, yaitu Kampung Wasnembri, Atori, Bonpaya, Bawei dan Beriambeker. Penentuan responden dilakukan dengan menggunakan teknik sampling secara acak. Berdasarkan hasil wawancara diketahui bahwa ada tiga jenis penyu yang melakukan proses peneluran di lima kampung, yaitu *Chelonia mydas*, *Derموchelys coriacea* dan *Eretmochelys imbricata*. Ancaman terhadap penyu di daerah ini adalah perburuan liar, pemanfaatan penyu sebagai sumber protein dan sumber pendapatan oleh masyarakat setempat dan hewan predator telur penyu. Ada tiga upaya konservasi yang dilakukan oleh masyarakat yaitu pelarangan orang dari luar kampung untuk mengakses daerah pantai pada saat musim peneluran hingga penetasan, masyarakat yang berburu penyu dan telur harus membagi hasil tangkapannya dengan tetangga atau keluarga dan kamuflase sarang telur. Sementara itu, masyarakat berharap adanya peningkatan upaya konservasi yang saat ini sudah dilakukan dengan cara pembangunan pos penjagaan dan patroli harian yang dilakukan oleh petugas dari Balai Besar Konservasi sumber Daya Alam Papua Barat pada saat peneluran hingga penetasan, adanya kejelasan peraturan dan sanksi bagi para pelaku perburuan liar dan timbal balik dari pelarangan pemanfaatan penyu yang diberlakukan oleh pemerintah dengan cara melibatkan masyarakat sebagai petugas monitoring penyu yang dipekerjakan langsung oleh Balai Besar Konservasi sumber Daya Alam Papua Barat dan pembangunan wisata penyu oleh pemerintah pemerintah Kabupaten Tambrauw.

**Kata kunci:** *Teteruga*, Habitat Peneluran Penyu, Wisata Penyu.

#### ABSTRACT

Along the coastal area of Mubrani District is turtle spawning ground. The spawning season is once a year, which is in April. This study aims to identify threats to turtles, conservation efforts applied by the community and the community expectations in improving conservation programs that have been carried out. This research was conducted in Mubrani District by interviewing 45 people in five villages, which are directly adjacent to the coastal area, namely Wasnembri, Atori, Bonpaya, Bawei and Beriambeker. Determination of respondents used random sampling technique. Based on the interview, it is known that there are three species of turtles who own the spawning ground in the five villages, which are *Chelonia mydas*, *Derموchelys coriacea* and *Eretmochelys imbricata*. The threats to turtles in these areas are poaching, the utilization of turtles mainly as a source of protein and a source of income by the local communities and predatory animal of turtle eggs. There are three conservation efforts formulated by the communities, namely prohibition of people from outside the villages to access the beach at the time of spawning to hatching, communities who hunt turtles and their eggs must share their catches with neighbours and or relatives and camouflage of turtle nests. Furthermore, the community expects to improve the current conservation actions by the establishment of monitoring post and daily patrols by field officers from the Natural Resources Conservation Division of West Papua Province at the time of spawning to hatching, clarity of regulations and sanctions for poachers and the reciprocity of the prohibition on the utilization of turtles imposed by the government, which are the community involvement as turtle monitoring officers employed directly by the Natural Resources Conservation Division of West Papua Province and turtle tourism development by the government of Tambrauw Regency.

**Keywords:** *Teteruga*, Turtle spawning ground, Turtle tourism.

## INTRODUCTION

Turtle is an animal that has a predicate as a “long-lived animal”. This animal is thought to have lived since ancient times 110 million years ago and can survive until today (Wojtczyk-Miaskowska & Schlichholz 2018). However, in the last few decades, turtles are one of the globally protected animals because their populations are at an alarming rate of extinction. The International Union for Conservation of Nature (IUCN) has listed turtles on the endangered to critically endangered status. It means that this species has a very high risk of extinction because their populations have dropped significantly. Meanwhile, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has also categorized turtles in Appendix 1, meaning that their circulation and trade have been banned worldwide. In the regulations of the Republic of Indonesia, turtles are also protected animals. Therefore, various conservation efforts have been taken by various institutions to maintain the conservation of this marine animal (Burke 2021).

There are several factors that influence the decrease of turtle population, including turtle poaching, destruction of turtle habitat and climate change (Pheasey *et al.* 2021; Isangedighi *et al.* 2020; Saba *et al.* 2012). Turtle poaching is caused by the high market demand for exotic and rare wild animals that are utilized as pets. Apart from being used as pets, poaching is also triggered by the communities’ nutritional needs for animal protein. This causes the rate of poaching to be almost out of control, especially in remote areas (Guebert *et al.* 2013). In addition to that, marine pollution due to plastic waste and other hazardous chemicals also causes damage to turtle habitats which results in turtle deaths (Li *et al.* 2016). For example, from 2018

to 2020, more than ten turtles were found dead stranded on the coast of Jembrana, Bali because the sea was polluted (Suriyani 2020). Furthermore, as a result of rising temperatures associated with climate change, a complete feminization of hatchling is possible to occur. This will certainly affect the turtle's reproductive process if there are more female turtles than male turtles (Laloë *et al.* 2014). All of these factors are impacts of human activities that can actually be controlled.

To protect an animal species, conservation efforts must be performed not only on the animal but also on its habitat. One of the turtle habitats scattered in the bird's head Papua is the spawning ground. Four of the seven species of turtles will rise and lay eggs in this area, namely leatherback turtles (*Dermochelys coriacea*), green turtles (*Chelonia mydas*), olive ridley turtle (*Lepidochelys olivacea*) and hawksbill turtles (*Eretmochelys imbricata*) (Mangubhai *et al.* 2012). These turtles migrate thousands of kilometers and come to the coast of the bird's head Papua to lay eggs two seasons a year. Turtle researchers concluded that the coastal area of Bird's Head Papua is the largest turtle spawning ground in the Pacific Region and contributes greatly to the turtle population in the Western Pacific (Tapilatu *et al.* 2017).

Mubrani District is one of the districts located in the bird's head Papua. Based on personal communication with one of the residents in Mubrani District (Dolfinus Kasi), it is known that turtles rise and lay eggs along the coast of Mubrani. However, over time, he discovered that the turtles that rose and lay eggs decreased in number each season. There are threats that cause the population of turtles to decrease. Identification of these threats needs to be undergone to formulate conservation programs that are right on target. In addition, the community

**Table 1.** The questionnaire.

No.	Questionnaire
1.	Personal Data (Name, Tribe, Age, how long stay in the village
2.	What are the species of turtles which lay their eggs on the beach?
3.	When do turtles lay their eggs?
4.	What are the causes of mortality of the turtles and their eggs?
5.	Are there any people from outside who come to purchase turtles and their eggs?
6.	Are you aware that turtles are being protected under the government law?
7.	What are the rules that have been established in the village to protect the turtles and their eggs?
8.	What are your expectations to improve the current rules to protect the turtles and their eggs?
9.	If your expectation is fulfilled, will you still utilize the turtles and their eggs?

has also implemented several conservation efforts for turtles. Therefore, this study aims to identify threats to turtles, turtle conservation efforts formulated by the community and community expectations in improving the turtle conservation programs that have been implemented. The novelty in this study is it provides the sight from communities on how they want to manage their natural resource to fulfill their needs while conserving it. The result of this study is it is expected to be the basic information to implement more targeted conservation policies by various related institutions.

## MATERIALS AND METHODS

### Research procedures

This research was conducted for three weeks divided into two periods of data collection. The first data collection was carried out for one week on 25 – 31 March 2022 and the second data collection was carried out for two weeks on 30 July 2022 – 13 August 2022. This research used descriptive methods. Data were collected by interviewing the Mubrani District head, village officials and permanent residents of the villages. A total of 45 people were interviewed with the determination of respondents using random sampling technique. The criterias to be the respondents are the people aged above 20

years old and have lived in the village over 10 years. Interviews were conducted based on the questionnaire that had been created (Table 1). The questions can be developed further according to the answers given by the respondents. The data obtained were analysed descriptively. A literature review and contextual approach were also used to complete the description of the study sites and the results.

### Study sites

The study was conducted in five villages located in the Mubrani District, Tambrau Regency, which are Wasnembri, Atori, Bawei, Bonpaya and Beriambeker. The location of the five villages is displayed in Figure 1. The selection of the villages is based on their location which is directly adjacent to the coastal area where the spawning ground of turtles is situated. These areas are also administratively included in the Mubrani-Kaironi Wildlife Reserve designated by the Minister of Forestry SK.783/Menhut-II/2014 on 22<sup>th</sup> September, 2014 about Forest and Marine Conservation area of West Papua Province, with an area of 249 Ha. Regulation of the Republic of Indonesia Number 68 of 1998 about Nature Reserve area and Nature Conservation area defines a wildlife reserve area as a nature reserve area that has distinctive characteristics

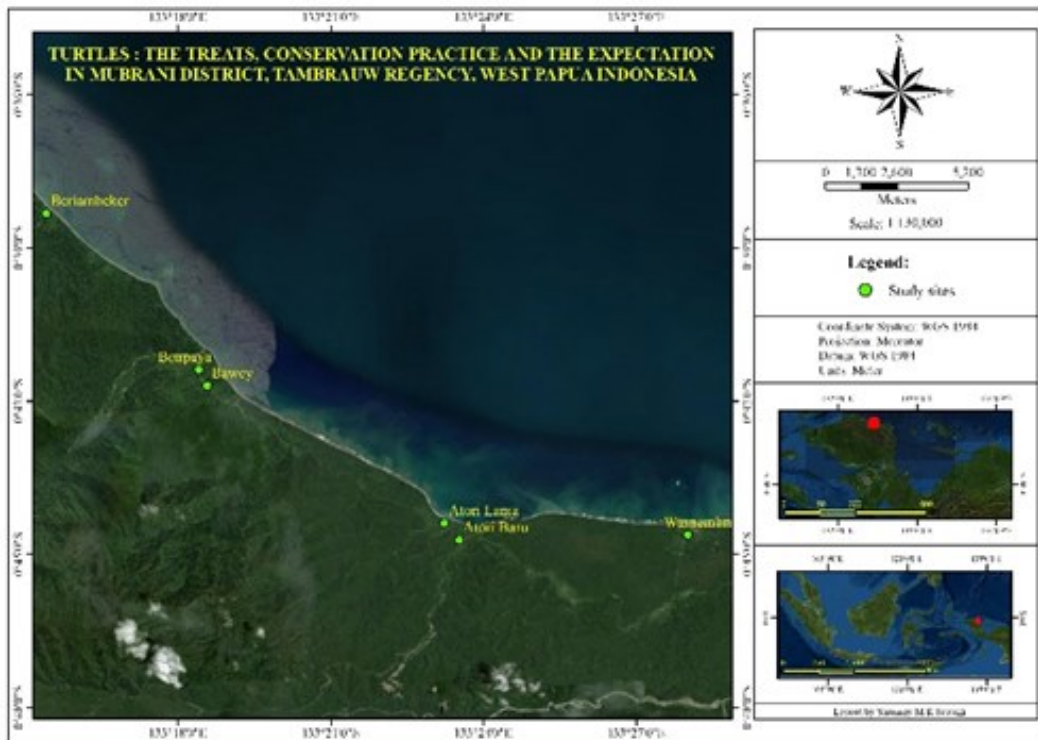


Figure 1. Location of the five villages.

in the form of diversity and/or uniqueness of animal species whose habitat can be developed for their survival. One species of animals that is unique to this area is turtles and their spawning ground. This area is managed by the Centre of natural resource conservation of West Papua Province. However, according to the custom of the local communities, the management of this wildlife reserve area is carried out by several clans, including Kasi and Makamba. This area is generally inhabited by the Meyakh sub-tribe which is called Mpur tribe (border tribe). Most people have hunting and farming livelihoods.

## RESULTS AND DISCUSSION

### Turtles and their spawning ground

The result of the interview showed that there are three species of turtles that rise and lay eggs in the coastal area of the villages of Wasnembri, Atori, Bawei, Bonpaya and Beriambeker. They are *Chelonia mydas* (in

local language: *teteruga ikan*), *Eretmochelys imbricata* (in local language: *teteruga sisir*) and *Lepidochelys olivacea* (in local language: *teteruga kepala kecil*). The turtle spawning season occurs once a year, which is in late March to April. The eggs will be left buried in the sand for around two months then the eggs will hatch and release hatchlings. At the time of the first round of interview, turtles have been in the sea around these villages and ready to lay their eggs on the coast. Turtles are migrated in a very wide range (Miller *et al.* 2018). This animal is unique because even though they can explore the vastness of the ocean, a turtle must return to the area where it was hatched to lay its eggs or carry out the spawning process (Lohmann *et al.* 2017).

At the time the interview was conducted, the villagers of Wasnembri and Bawei opened the access to the beach. Meanwhile, the people of Atori, Bonpaya and Beriambeker villages forbid people from outside to access the



**Figure 2.** Turtle spawning ground. A: Wasnembri, B: Bawey.

beach. The reason for closing the access was because the communities did not want outsiders to see and steal turtles and their eggs. This is one of the communities' ways to protect their natural resources. Besides, turtle spawning ground is vital since it determines the success of the reproductive process. This place must be cleared from human activity. According to the respondents, if there are disturbances such as noise or bright lights, turtles can abort to lay their eggs.

Figure 2 shows that the characteristic of the two beaches of Wasnembri and Bawei villages is similar, which has dark grey sand and a wide sandy area. This is in accordance with the results of research conducted by Benni *et al.* (2017) that stated, in Papua, turtles, generally, lay their eggs in sand which tends to be dark in colour and has wide sandy area because it can keep the temperature and a turtle usually will have clutch frequency more than two thus, they need space.

### Threats to turtle populations

Interviews conducted to 45 respondents showed that the threats to turtles in the five villages were the same. They are poaching of turtles, which is the biggest threat, predatory animals of turtle eggs and the utilization of turtles by the communities. Threats to turtle populations are factors that can cause a decline

in the turtle populations in an area within a certain period. These factors can occur naturally and/or anthropogenically (Casale *et al.* 2018).

### Poaching of turtles and their eggs

The interview data shows that the biggest threat to turtles in Mubrani District is the poaching of turtles and their eggs by people from outside the villages. This is because they hunt by catching all the turtles and the eggs that can be discovered and it always occurs every spawning season. Globally, one of the causes of the decline in turtle populations is excessive poaching (Stanford *et al.* 2020). Generally, the poachers come at night by car and/or by boat. They hunt turtles in two ways, catching turtles that have come to land to lay eggs and hunting turtles in the sea using various equipment such as diving equipment, nets, weapons and spears. It is easier to catch turtles that are already on the land, by simply turning the turtle upside down (plastron above). The bird's head coastal area within the Tambrau regency is the largest turtle nesting habitat in the Pacific Region. Range clutch frequency of turtles is 2-7 while the clutch size is 14-128 (Chatting *et al.* 2018; Fonseca *et al.* 2018; Kumar 2013). Therefore, during this egg-laying season, the turtle will be abundant in the sea around the spawning grounds.

Meanwhile, to find egg nests, the poachers follow the trace left by the turtle and take all the eggs in the nest.

Eight respondents in Wasnembri village claimed that in October 2021, 13 adult turtles were stolen. This number is the highest number of turtle poaching cases that have been caught by the community. The community caught the poachers but all the turtles had been killed so none could be released back into the sea. According to the community, the absence of electricity in the village makes it is difficult for the community to control outsiders entering and leaving the village, particularly at night, using four-wheeled vehicles or boats. However, although there is electricity in the other four villages, a similar incident also happened because there were no village security patrols and monitoring from the agency responsible for the Mubrani-Kaironi wildlife sanctuary. According to the community, this always happens every egg-laying season. However, only a few cases of turtle poaching have been caught by the community and all poachers freed.

#### *Predatory animals of turtle's eggs*

Dogs and monitor lizards (*Varanus* spp.) are predators of turtle eggs around the villages. These two animals are often observed digging in the sand to search for turtle eggs. The eggs found will be directly consumed by tearing the turtle egg shells using their claws. The population of dogs and monitor lizards is quite abundant in the five villages. The people of the Mubrani district generally work as farmers and collectors of forest products. Therefore, dogs are very commonly found as pets because they can be used as companions in the garden and the forest. Meanwhile, healthy forest conditions cause the lizard

population to be ample. Williams *et al* (2020) also discovered that the predators of turtle eggs are fox, monitor lizards, racoon and ghost crabs. The turtle digs a hole that will be used as the egg nest, lays the eggs, closes the hole and then leaves. The eggs are not incubated and are not guarded by the turtle. The eggs are left to hatch and then the hatchlings will come out from the underground nest chamber and crawl back into the sea (Rudianto & Bintoro, 2018). However, not all the eggs in the nest can hatch. There are various factors that can cause turtle eggs to fail to hatch, including the presence of predatory animals (Korein *et al.* 2019). Predation is the threat that occurs naturally in nature. All living creatures will be connected in the food chain, which is the relationship between eating and being eaten for energy transfer (Lovich 2018).

#### *The utilization of turtles by the local communities*

Since the time of the ancestors, people have used wild animals in the sea and on land to meet various needs of their lives, including the body's protein needs (Wall *et al.* 2014). Turtle is one of the marine animals that are widely utilized in Papua (Tapilatu *et al.* 2020). Communities in the villages of Wasnembri, Atori, Bawei, Bonpaya and Beriambeker utilized turtles either only for consumption and/or for trading. Every egg-laying season, the villagers will also hunt for the turtle and its eggs. According to the community, turtle meat has high nutritional value and is useful as medicine. Turtle meat is high in protein, low in fat and rich in calcium and iron (Rothamel *et al.* 2021). The communities argued that turtle meat is a cure for internal injuries of the body caused by excessive tension in the muscles, reducing fever and liver disease.

Turtle eggs are also consumed raw as a medicine for asthma (Taran *et al.* 2022). In addition to that, turtle meat and eggs are also traded to the city of Manokwari and/or the nearest market (Sp 9 Market) as a source of household income. Turtle meat will be smoked first and be traded at IDR 50,000 per piece which is around one kilogram while turtle eggs will be sold raw for IDR 50,000 per stack of 20-25 eggs. Furthermore, turtle carapace can also be processed and used as jewellery (bracelets, rings), combs and wall decorations. Another thing that was also found from this interview was that 17 respondents used turtles passively. It means they did not hunt but only utilized them if their neighbours or relatives provided them. This is because they are aware of the prohibition related to the use of turtles and/or they reduce meat consumption due to illness. According to the respondents, there are many residents who have reduced their consumption of turtle meat since they learned about the government policy to protect turtles.

### **Community conservation efforts**

As communities that live hand-in-hand and depend on forest and marine products for their livelihoods, the people of the Mubrani District, particularly in the villages of Wasnembri, Atori, Bawei, Bonpaya and Beriambeker have realized the importance of conservation efforts for their animals and plants. This is also supported by the determination of Tambrauw Regency as a Conservation Regency, leading the community to become more aware of its nature. They have implemented various simple conservation programs on natural resources which are valuable, for example, turtles. Turtle is a wild animal that is abundant in the sea of Mubrani district during

every turtle spawning season. Recognizing all the threats to this animal, the people in the five villages implemented prohibition of people coming from outside the villages to access the beach, sharing turtle catches and their eggs, and camouflaging turtle nests as community efforts to conserve turtles. However, at the time this study was carried out, the communities closed access to the beach so that there were limitations in taking photos of the activities.

### *Prohibition of people coming from outside the villages to access the beach*

Excessive poaching of turtles by people from outside the village has caused the communities in the villages of Wasnembri, Atori, Bawei, Bonpaya and Beriambeker to implement a prohibition of people coming from outside the villages to access the beach during the spawning season until the hatching of turtle eggs. The communities asserted that it is turtle poaching that can reduce the turtle population significantly because the poachers catch turtles and their eggs in large quantities and continuously. In the past, before this ban was enforced, the community saw that there would be many outsiders who came during the turtle spawning season to hunt turtles with the frequency of arrivals almost every day. The population in these villages is low thus people will know each other. They quickly identify people from outside the villages. After the turtle socialization delivered by various conservation-related institutions, the community became more concerned and enforced the ban. Although this prohibition does not yet have a strict system because there are no village security patrols on shift duty, the communities stated that this prohibition is sufficient to reduce the number of turtle poachers who

come by using four-wheeled vehicles. The community will also put wooden bars at the entrance of the village so that no vehicles pass through.

#### *Sharing the catches*

Sharing the catches has existed and has been taking place in people's lives in the five villages for a long time. If villagers go hunting and have an excessive catch, it will be shared with neighbours and/or relatives. This is in line with conservation action to prevent the over-exploitation of natural resources. Turtle has high nutritional value and is one of the wild animals that only can be found during the spawning season. This has led to an increase in the demand for turtle meat and their eggs. However, the communities still apply conservation efforts in the utilization process. In addition to sharing turtle catches, the community also imposes restrictions on the number of turtles and their eggs. Moreover, there is a limitation to collect turtles to a maximum of two and the eggs can only be taken a maximum of half of the number of eggs in the nest. This is because people also need animal protein intake for their bodies so they continue to utilize turtle meat and eggs even though they know that there is a prohibition. The communities of the Mubrani district find it difficult to obtain farmed meat such as chicken and beef because the distance to the nearest market is quite far and the price is high for the communities thus alternative protein sources from wild animals become the choice.

#### *Camouflaging of turtle nests*

Nest camouflage is the act of disguising the nest so that it is not easily visible or

recognizable. Camouflaging of turtle nests is also performed by the turtle. After covering the eggs with the sand, the turtle will camouflage the nest around the original nest by ruffling the sand around the nest to disguise the original nest (Voves *et al.* 2016). However, this can be easily identified because the turtle leaves a distinctive imprint from its legs in the sand. Therefore, the communities of Bawei and Bonpaya will tidy up the sand from the turtle trace and dig holes in other places to make it look like the original nest that has been dug and eggs taken. This nest camouflage certainly cannot deceive the predators who use their sense of smell to find turtle eggs. However, this is quite successful in camouflaging the nests from poachers.

#### **Community expectations of turtle conservation practices**

A successful conservation program can be marked by a good cooperative relationship between stakeholders, such as the government and the communities. The government is the policy maker that formulates the policy based on the views of all the stakeholders and builds the infrastructure to support the policy, meanwhile, the community is generally the program implementer (Yewen & Ariwangsa 2018). Communities in the five villages expect good cooperation from the government in fulfilling supporting factors that are important for the implementation of an effective and efficient turtle conservation program, which are the establishment of monitoring posts and daily patrols, clarity of regulations and criminal provisions for poachers and reciprocal of prohibition. The communities stated that they are able to stop utilizing turtles if the government fulfills their expectations.



*The establishment of monitoring posts and daily patrols*

Respondents in the five villages stated that the establishment of monitoring posts and daily patrols carried out by field officers from the Natural Resources Conservation Division of West Papua Province is one of the most important things to do in turtle conservation efforts in Mubrani district. The community has realized the importance of turtle conservation efforts and implemented them. However, the community expects the Natural Resources Conservation Division of West Papua Province to have monitoring posts and daily patrols with the aim of reducing the incidence of poaching. The Natural Resources Conservation Division of West Papua Province is one of the divisions under the ministry of environment and forestry, which, of course, has a greater influence in catching and imposing criminal sanctions directly on the poachers compared to only local communities. Moreover, The Natural Resources Conservation Division of West Papua Province is the government representative responsible for managing the Mubrani-Kaironi wildlife sanctuary. According to the community, monitoring by this institution is rarely performed and mostly done when it's not turtle spawning season. The community said that The Natural Resources Conservation Division of West Papua Province could build a monitoring post with land that would be provided by the communities and then assign 1-2 patrol officers who would stay in the village during the egg-laying season until hatching. The community cannot carry out daily patrols because the community is generally tired of working all day in the garden and in the forest so that at night it is used to rest.

*Clarity of rules and criminal provisions for poachers*

The communities expect that the written rules and criminal provisions are given to the villages so that they can be published on an information board placed on the beach and villages official archives. Thus, all visitors who come to the villages can read and be aware of these regulations. In addition, this needs to be done hence the communities have clear information when making efforts to arrest the poachers. Currently, as a result of unclear regulations and criminal acts, the public has difficulty.

Various conservation-related institutions both in Indonesia and abroad have issued regulations and criminal provisions related to turtle protection. In Indonesia, turtles are one of the protected wild animals based on the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.106/MENLHK/SETJEN/KUM.1/12/2018 about the second amendment to the regulation of the Minister of Environment and Forestry Number P.20 /MENLHK/SETJEN/KUM.1/6/2018 about protected plant and animal species. This regulation is reinforced by the Law of the Republic of Indonesia number 5 of 1990 concerning the conservation of natural resources and their ecosystems. Chapter 21 verse 2 states that everyone is prohibited from:

- a. Catching, injuring, killing, keeping, possessing, maintaining, transporting and trading protected animals alive;
- b. Storing, possessing, maintaining, transporting and trading protected animals that are dead;
- c. Releasing protected animals from one place in Indonesia to another place inside or outside Indonesia;

- d. Trading, storing or possessing skins, bodies or other parts of protected animals or goods made from parts of these animals or releasing them from one place in Indonesia to another place inside or outside Indonesia;
- e. Taking, destroying, eradicating, trading, storing or possessing eggs and/or nests of protected animals.

The law also mentions criminal provisions for violators of these provisions. The criminal provisions mentioned in chapter 40 verse 2 and 4, which are whoever deliberately violates the provisions as referred in chapter 21 verse 1 and 2 and chapter 33 verse 3 should be sentenced to a maximum imprisonment of 5 years and a maximum fine of IDR 100,000,000.00 (one hundred million rupiah) and whoever because of negligence violates the provisions as referred to chapter 21 verse 1 and 2 and chapter 33 verse 3 should be sentenced to a maximum imprisonment of 1 year and a maximum fine of IDR 50,000,000.00 (fifty million rupiah).

#### *Reciprocal of the prohibition*

The government has socialized the prohibition on the utilization of turtles because of the conservation status of this animal. However, turtles are utilized as a source of protein. When the spawning season comes, the turtle will be abundant in the waters of the Mubrani district so they are easy to be hunted. Thus, the communities expect a reciprocal from this prohibition. The communities are committed to no longer catching and utilizing turtles and their eggs, but the government must do two actions in return, which are the involvement of the community as turtle monitoring officers employed directly by The Natural Resources Conservation Division of

West Papua Province and the development of turtle tourism by the local government of Tambrauw regency.

The first, the communities in the study sites offered to the Natural Resources Conservation Division of West Papua Province to hire with a salary of IDR 3,500,000/month to carry out day and night monitoring of turtles and their eggs during the spawning season to hatching eggs which takes  $\pm$  3 months. People who live in the villages find it easier to perform the job than if it has to be carried out by field staff of the Natural Resources Conservation Division of West Papua Province. It is a four-hour trip from the city of Manokwari. Moreover, the communities need to be rewarded so that their needs can be fulfilled and they can focus on monitoring the turtles and their eggs. Secondly, the communities have realized that turtles are one of their uniqueness, so, with the development of turtle tourism by the government of Tambrauw regency, the communities can earn income from the tourism activities. Turtle tourism can be done by presenting views of the turtle spawning process and releasing hatchlings. It can be performed academically. The Law of the Republic of Indonesia number 5 of 1990 about the conservation of natural resources and their ecosystems stated that within the Wildlife sanctuary Areas, limited tourism activities can be carried out. However, this tour must still pay attention to the ideal conditions for the turtle to lay eggs and the hatching process of the eggs.

#### **CONCLUSION**

The threats to turtles in these areas are poaching, the predation to turtle's eggs and the utilization of turtles mainly as a source of protein and a source of income by the local com-

munities. There are three conservation practices established by the communities, namely prohibition of people from outside the villages to access the beach at the time of spawning to hatching, sharing the catches (turtle's meat and eggs) with neighbours and or relatives and camouflage of turtle nests. Furthermore, the communities expect to improve the current conservation actions by the establishment of monitoring post and daily patrols by field officers from the Natural Resources Conservation Division of West Papua Province at the time of spawning to hatching, clarity of regulations and sanctions for poachers and the reciprocity of the prohibition on the utilization of turtles imposed by the government, which are the community involvement as turtle monitoring officers employed directly by the Natural Resources Conservation Division of West Papua Province and turtle tourism development by the government of Tambrauw Regency.

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