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# Wattled Brushturkey hunting system in the Sigim and Sinaitousi communities in the buffer zone of the Arfak Mountain Nature Reserve, West Papua, Indonesia

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**Abstract.** *Manik H, Yurmiaty H, Asmara IY, Handarto, Iskandar J, Partasasmita R. 2018.* Wattled Brushturkey *hunting system in the Sigim and Sinaitousi communities in the buffer zone of the Arfak Mountain Nature Reserve, West Papua, Indonesia. Biodiversitas 19*: *849-856.* Illegal hunting is still the cause of the decline of wildlife populations in nature. This is particularly the case with protected wildlife and endemic species, such as the Wattled Brushturkey in Palau West Papuan. Thus, research needs to be done on the hunting system at the site. The aim of this research was to know Wattled Brushturkey (*Aepypodius arfakianus*) hunting system by Sigim and Sinaitousi villagers, Arfak Mountains of West Papua. The research used descriptive method with field observation technique and semi-structured interviews. The results showed that the main purpose of hunting Wattled Brushturkey conducted by the Sigim and Sinaitousi communities is to consume the meat, while a part of egg hunting is for sale. The hunting by the two villagers was generally done in groups. The frequency of hunting depends on needs and demand. Hunting is done using snares, dogs, and combinations of snares and dogs. The tools used are snares, machetes, air rifles, arrows nad bows. The modern tools such as gun have been used in both villages. The hunting of Wattled Brushturkey begins in the morning and continues until late afternoon. The location of hunting is usually primary forest, secondary forest of former garden and river basin.

**Keywords**: Hunting system, Wattled Brushturkey, West Papua, Sigim, Sinaitousi

## INTRODUCTION

Indonesia is rich in biodiversity including wildlife, one of natural resources that have very important benefits for local people living around the forest (Awak et al. 2015). Historically, most local or ethnic communities in the world, including in Indonesia, have a close relationship with wildlife (Iskandar 2012). The uses of various types of wildlife including mollusks, fish, amphibians, reptiles, birds, and mammals have important functions, especially socio-economic and cultural values (Alves 2012; Partasasmita et al. 2016; Iskandar et al. 2016).

Hunting and collecting wildlife in the Papua region, especially for those living adjacent to forests, are important aspects of life in rural communities because those activities are their way of life (Pattiselanno 2006). They hunt because they have limited access to animal protein from domestic livestock, so that wildlife is the source of food for them. The hunted animals by local Papuans that have been reported were, among others, deer (*Cervus timorensis*) (Murwanto et al. 2008), long snout hedgehog (*Zaglossus bruijnii*) (Crew et al. 2015), and cuscus (*Phalanger* spp.) (Pattiselanno 2006: Pattiselanno and Koibur 2008).

The wildlife hunted by local communities generally varies depending on the species of animals that live around the forest surrounding the residential area. According to Pattiselanno (2006), in addition to terrestrial mammals, birds are the most often hunted animals in Papua. One species of bird in Papua that has long been exploited by the local community is Wattled Brushturkey (*Aepypodius arfakianus* Salvadori, 1877) belonging to megapode bird and is registered as the Indonesian bird (Sukmantoro et al. 2007). Megapode birds are unique animals, for example in breeding. One of the megapodes, i.e., Maleo, lays eggs which are not hatched by the parent birds, but are placed on a pile of leaf litter whose source of heat comes from microbial decomposition (Dekker et al. 2000).

The Arfak Mountains Nature Reserve area (CAPA) is the habitat of the Wattled Brushturkey where they live and breed naturally. High mountains with steep topography and dense primary forests with thick foliage are the preferred area of Wattled Brushturkey (Behler et al. 2001; Kartikasari et al. 2012). Villagers of Sigim and Sinaitousi are indigenous Papuans living in CAPA buffer zones, who have long used megapode birds as a source of food and family income for generations. The high demand is

inseparable from food needs of wildlife origin, especially because the size of meat and eggs Maleo are relatively large (Manik et al. 2015). To maintain the Wattled Brushturkey population in the area, it is necessary to apply good management for business efforts to utilize it.

To maintain the sustainability of nature and to meet the needs of life and welfare of the community around the area of the habitat of the animals, conservation measures are required. The conservation program developed should take into consideration the aspect of utilization that has been going on for generations, namely the socioeconomic aspects of this bird species. Utilization of Wattled Brushturkey by local indigenous Papuans in the CAPA Region especially the hunting system has not been recorded well. So, this research on hunting system in the community of Village (*Kampung*) Sigim and Sinaitousi is necessary.

## MATERIALS AND METHODS

### Site location

The study was conducted in Sigim Village located at the coordinates of 133051'11 "E, 108'48" S and in Sinaitousi Village at coordinates 133051'32 "E, 108'10" S, in the Sub-district of Minyambou, the District of Arfak Mountains, West Papua Province, Indonesia. It is the buffer zone of the Arfak Mountains Nature Reserve (CAPA) with an area of 68,325 hectares, located in the territory of the Bird's Head of West Papua Province. Sigim Village and Sinatousi can be reached using a special four-wheeled vehicle for 2.5 hours (± 70 km) from Manokwari city of West Papua Province or for 1.5 hours (± 30 km) from the Anggi capital of the Mountain Sub-district Arfak. The location of research in Sigim Village and Sinaitousi can be seen in Figure 1.

### Procedure

This study used a combination of qualitative and quantitative methods, based on ethnozoology or biological research approaches (Iskandar 2012). Quantitative methods were used in the form of semi-structured interviews based on prepared questionnaires. Qualitative methods used were direct observation in the field and interviews. The selection of respondents was done by census, so that all the heads of families who were in place during the study and hunting Wattled Brushturkey were selected. To obtain more accurate information, several key informants, namely traditional leaders and community leaders were interviewed. The respondents who were interviewed all heads of households who were active and passive in hunting Wattled Brushturkey. Direct interview was conducted on 10 heads of Family (KK) of Sigim Village and 12 heads of family (KK) of Sinaitousi Village conducting hunting activity.

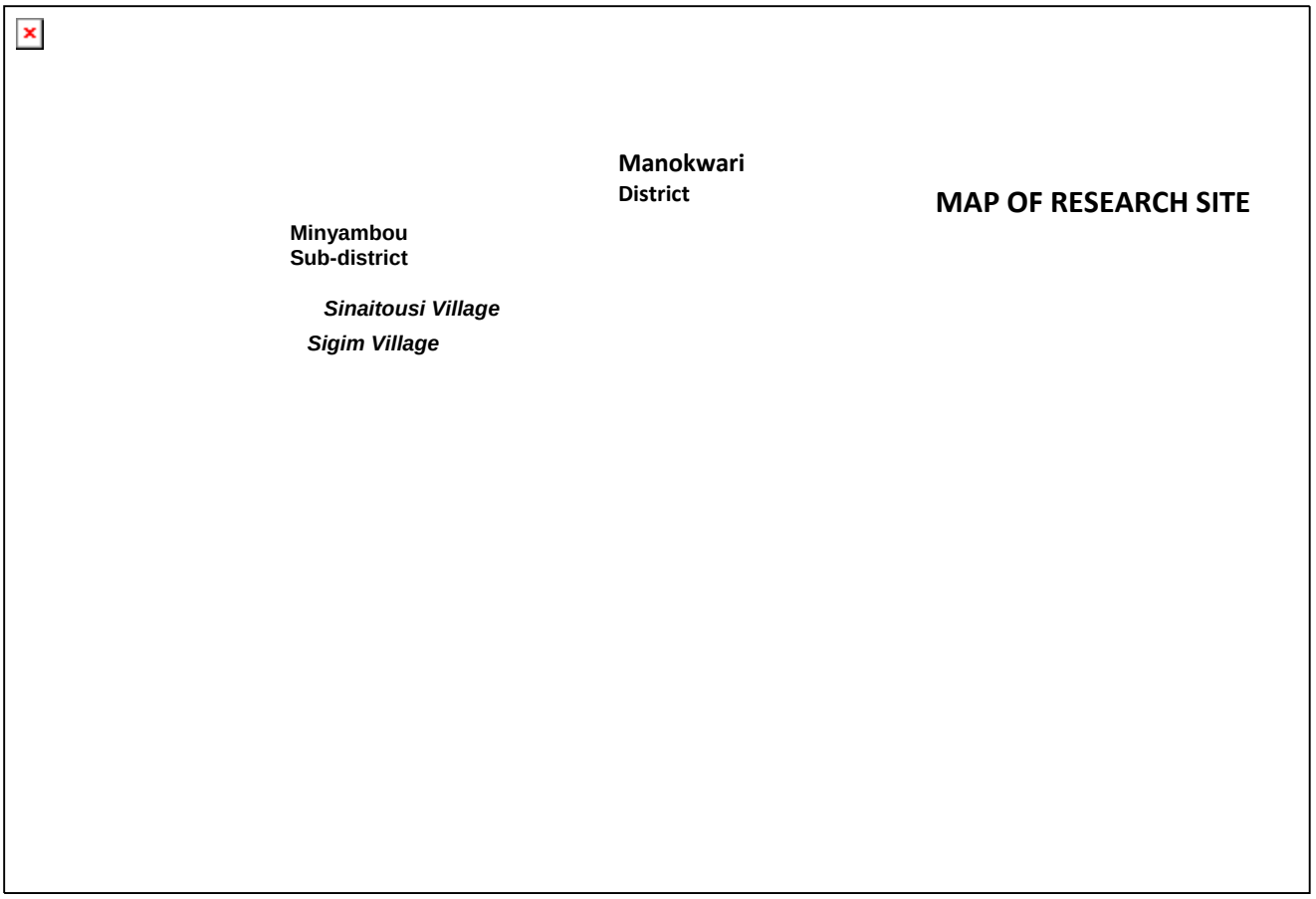


**Figure 1.** Research location of Sigim and Sinaitousi Villages, Sub-district of Minyambouw, District of Arfak Mountains, West Papua Province, Indonesia

**Data analyses**

Qualitative data were analyzed by checking them directly in the field, drawing conclusions and conjectures, and reporting them in narrative with descriptive analysis. The quantitative data from the interviews with the respondents were tabulated with simple statistics, that is by calculating the percentage of respondents' answers; the results were made in narrative with descriptive analysis (Newing et al. 2011).

## RESULTS AND DISCUSSION

**Poaching activities of Arfak tribes**

The indigenous people who live in the buffer zone of the Arfak Mountains Nature Reserve (CAPA) are Arfak tribe consisting of four major tribes, namely Hatam, Sougb, Moule, and Meyakh. The villagers of Sigim and Sinaitousi consist of the tribes of Hatam and Meyakh. The farming system of the people of both villages is still shifting cultivation. The results of this observation are in accordance with Manik and Sonbait (2008) statements, that the moving gardening system is the generally prevailing system in Papua for people who are inland and mountainous like the Arfak tribe.

Arfak people actually have a customary concept of the area known as "Igya Ser Hanjop", the implementation of this system is the understanding and agreement of the community for the determination of some areas as conservation areas. The conservation area consists of three zones, i.e., Bahamti (conservation area), Nimahanti (limited area/buffer) and Susti (utilization area) (Laksono et al. 2001).

Hunting wildlife is an integral part of the life of the people of Arfak in the fulfillment of animal food. Although animal hunting is common in Arfak tribes, information and observations during the study demonstrate that the community hunt certain types of animals that have relatively large body weight and economic value, making it sufficient for consumption for the family. The selection of wildlife hunted is correlated with the number of animals obtained, the market economy value, and the food demand in each hunting (Escarnila et al. (2000). According to Sinery and Sutedjo (2009), in the settlement of indigenous people living in the Arfak Mountains Nature Reserve area, each house may be inhabited by 1 to 2 families or one family may own more than one house. The types of animals commonly hunted by the villagers of Sigim and Sinatousi can be seen in Table 1.

**Hunting activities of *Aepypodius arfakianus***

Hunting of Wattled Brushturkey and collecting of its eggs have been conducted by the communities of Sigim and Sinatousi Villages from generation to generation. Knowledge of bird hunting techniques and egg collecting using traditional tools is part of the local wisdom of the Arfak tribe people to keep the birds in the wild.

The ability of people to recognize visible bird footprints and to see signs around the habitat such as food scraps and dirt making it easier for them to install traps or traps without baiting. Their knowledge of the breeding season of Wattled Brushturkey is the most interesting to learn. The people of Arfak tribe, in particular, Sigim and Sinatousi villages know the breeding season by looking at the main natural signs of *Litsea* tree (*Litsea ledermanii* Tesch.) or, in Hatam local language it is called wap ngat. The flower and fruit of *Litsea* tree can be seen in Figure 2.

When the *Litsea* tree begins to bloom, the local community understands it as the start of the good season. At the time of the flowering season, the forest usually becomes yellowish, making it easy to see. In this period, the parent immediately set up the nest for the female to lay eggs. Large nests are made, looking like volcanoes and the area around nest is clear of foliage, make it easier for hunters to know the location of nesting.

**Purposes of hunting activity**

The purpose of Wattled Brushturkey hunting activities conducted by residents of Sigim and Sinaitousi Villages can be seen in Table 2.

**Table 2.** The purposes of Wattled Brushturkey hunting in Sigim and Sinaitousi Villages of Arfak Mountains, West Papua, Indonesia

| Hunting purpose | Number of heads of family | | Ratio (%) | |
|---|---|---|---|---|
| | Sigim | Sinaitousi | Sigim | Sinaitousi |
| Consumption | 10 | 12 | 100.0 | 100.0 |
| Sale | - | - | 000.0 | 000.0 |
| Consumption and sale | - | - | 000.0 | 000.0 |
| Total | 10 | 12 | 100.0 | 100.0 |

**Table 1.** The wild animals hunted by the villagers of Sigim and Sinatousi of Arfak Mountains, West Papua, Indonesia

| Local name (Hatam tribe) | English name | Indonesian name | Scientific name |
|---|---|---|---|
| **Mamalia** | | | |
| Nab nipia | Wild boar | Babi hutan | *Sus scrofa* |
| Anday | Timor deer | Rusa timor | *Cervus timorensis** |
| Miyei bria | Common Spotted cuscus | Kuskus totol | *Spilocuscus maculatus** |
| Jei a | Ground cuscus | Kuskus tanah | *Phalanger gymnotis** |
| **Aves** | | | |
| Sumug a | Wattled Brushturkey | Wattled Brushturkey | *Aepypodius arfakianus** |
| Hadingat | Dwarf cassowary | Kasuari kerdil | *Casuarius bennetti** |

Note: *) Animals protected by Law no. 5, 1990 and PP no 27, 1999 (Sukmantoro et al. 2007)


**Figure 2.** Flower and fruit of *Litsea* tree (*Litsea ledermanii*)

The villagers of Sigim and Sinaitousi hunt Wattled Brushturkey for their own consumption. According to Thomas (2010), wildlife poaching in the New Guinea region (Island of Papua) is one of the most important activities for indigenous people's livelihood as it provides most of the animal protein for the family.

Generally, Sigim and Sinaitousi communities do egg collecting for their own family consumption, but if they need money, they sell the eggs. The results showed that more than 66.7% respondents consumed eggs from egg collecting in the wild during the bird's breeding season and only a small portion (33.3%) of respondents consumed and sold the eggs. They sell eggs if there is an urgent need or they want to increase household income in both villages. The marketing of eggs is done simultaneously by selling the produce to the main market of Manokwari City. According to Pangau et al. (2012), the hunting conducted in the Papua region at this time has shifted from pure subsistence activities to more commercial systems due to market demand. This is also supported by the statement of Partasasmita et al. (2016) that the use of wild animals by local or ethnic communities in villages in Indonesia is determined more by economic factors, because at present, local wisdom tends to be neglected due to various factors of rapid cultural and socioeconomic changes.

## Hunting activities

The hunting methods commonly used by Sigim and Sinaitousi villagers in hunting Wattled Brushturkey can be seen in Table 4. The hunting method of Wattled Brushturkey conducted by people from both villages is generally the same, where the equipment used in hunting are snares, air rifles, machetes, and arrows and bows. More than 50% respondents generally used meshes (passive method) because the wood and twigs to make meshes are easily found around the forest, while the straps using nylon ropes to trap the bird's legs are available at shops in both villages or surrounding areas.

The equipment used is different for each target animal. This is supported by the statement of Awak et al. (2015) that the ways and functions of using hunting tools differ, depending on the type of hunted animals and hunting techniques. The modern hunting tools such as air rifles have been used by communities in wildlife hunting activities. The shifting use of hunting tools is thought to be one way to make it easier to get the game. Modern hunting tools like air rifles owned by local people are generally used as a means of hunting for birds (Pattiselanno and Mentasan 2010). The hunting tools commonly used by Sigim and Sinatousi villagers are shown in Figure 3.

## Hunting methods

Based on observations and interviews with hunters, there are several methods of hunting Wattled Brushturkey birds, as below.

**Table 3.** The purposes of collecting the Wattled Brushturkey eggs in Sigim and Sinaitousi Villages of Arfak Mountains, West Papua, Indonesia

| Hunting purpose | Number of heads of family | | Ratio (%) | |
|---|---|---|---|---|
| | Sigim | Sinaitousi | Sigim | Sinaitousi |
| Consumption | 8 | 8 | 80.0 | 66.7 |
| Consumption and sale | 2 | 4 | 20.0 | 33.3 |
| Total | 10 | 12 | 100.0 | 100.0 |

**Table 4.** Maleo hunting methods commonly used by Sigim and Sinaitousi villagers of Arfak Mountains, West Papua, Indonesia

| Hunting method | Number of heads of family | | Ratio (%) | |
|---|---|---|---|---|
| | Sigim | Sinaitousi | Sigim | Sinaitousi |
| Snares | 6 | 7 | 60.0 | 58.3 |
| Dog | 1 | 2 | 10.0 | 16.7 |
| A combination of snares and dogs | 3 | 3 | 30.0 | 25.0 |
| Total | 10 | 12 | 100.0 | 100.0 |

**Figure 3.** Sigim and Sinatousi community hunting tools in Arfak Mountains, West Papua, Indonesia

**Figure 4.** Model of traditional Wattled Brushturkey snares tool in Arfak Mountains, West Papua, Indonesia

**Snares**

People who use the snare method, begin the hunting with the observation of footprints or scattered food. Once the trace of the animal's daily activity is known, the location is used as a place for making snares. Traditional tool models used can be seen in Figure 4.

Installation of snares for Wattled Brushturkey is done in the morning or late afternoon, on the path of daily activity around the garden or former garden. Traditional snares consist of (i) two pieces of wood clamp, one is plugged near the rope trap and made curved and the other serves to link the rope, (ii) rope trap, diameter of 10-15 cm, (iii) rope swing 1-4 m long, (iv) four pieces of para-para trap wood, (v) small and strong fruit wood as a swing trap.

The inspection of meshes is usually done by hunters from Sigim and Sinaitousi Villages 2-3 days after the trap is installed. After that, the snares are checked once in a week, but if no results are obtained, then the meshes will be moved elsewhere. The number of snares commonly installed by the people of both villages quite varies, between 10 and 40.

**Dogs**

People living on hunting animals in Papua use dogs to help them in hunting and protect them from dangerous animals. Communities in both villages train their dogs using ropes made of creeping plant (*Meremia* sp.). The part of the rod of forest ropes that have been cut is then blown on the nose, and mouth, and the second part is used to hit the dog's abdomen. This activity is done several times until the smelling sense is sharp. Generally, the way to quickly train the dogs is bringing them along with pack of dogs that are used for hunting.

Two-six trained dogs are usually used for one-time hunting, and this method is commonly used in remote hunting locations where the presence of these birds at hunting sites are not known. Utilization of dogs as hunting animals has been done for a long time and is part of the local wisdom of indigenous people living in Papua.

**A combination of snares and dogs**

The combination of snares and dog for hunting is usually done when there is a special event of the whole village community, when the need of meat is large, such as during religious holidays or welcoming local leaders. The combined method is not done specifically for Wattled Brushturkey hunting, but it is done for hunting of large wildlife, like deer and wild boar. If these birds are found in the area of hunting location, they will be hunted too. Some of the methods used are adaptations from generation to generation to get high results. This result is in line with the opinion of Wilkie et al. (2000) that the development of hunting methods is a form of demands for increased economic benefits of animals by local communities.

**Number of hunting members**

The number of hunters in the Wattled Brushturkey hunting group in Sigim and Sinaitousi Villages can be seen in Table 5.

Hunting was performed individually and in groups in Sigim and Sinatousi villages, but generally (over 66.7% ) it was done in groups. They hunt in groups, presumably, because the hunting location is far enough, so forming a group can help fasten the snares and bring the game and protect each other from dangers such as snakes or other disturbances during hunting. The number of members in a group usually ranges from 3 to 7 people, and usually, the selection of members is based on family relationships. Hunting with group models are also reported by the research results of Awak et al. (2015), which found that cooperation in hunting will greatly affect the results of the hunting.

**Hunting location**

Maleo hunting by villagers Sigim and Sinatousi villages are conducted in the forest around the village. The location of hunting is usually in primary forest, secondary forest of former garden and river basin. The location of the hunting is still limited to each clan area or based on clear and

mutually agreed customary rights. According to Pattiselanno and Mentasan (2010), site boundaries are common to indigenous peoples in Papua, such as the results of the Maybrat tribe that the rules are firmly and consciously understood by the members of the clan so that hunting should not pass through their customary land.

The location of the bird's habitat is quite difficult to reach because we must walk two hours into the wilderness, and, in some location, we must cross a river. The location is in rocky, slippery mountainous terrain, over the ravine. One bird's habitat the most commonly visited for hunting is at the coordinates of 133051'12 "E and 107'56" S. It is presumed that the habitat location for elusive Wattled Brushturkey birds is difficult to reach in order to avoid natural predators such as wild boar (*Sus scrofa*) and monitor lizard (*Varanus* sp.), and hunters approaching the nest. Wattled Brushturkey hunting area by indigenous people of Sinaitousi Village in primary forest can be seen in Figure 5.

**Hunting activity**

The frequency of hunting by respondents in Sigim and Sinatousi Villages can be seen in Table 6. Sigim and Sinaitousi villagers usually hunt Wattled Brushturkey during breeding season especially to get eggs, while the hunting of adult birds are done without considering the seasons, but based on the need and demand. The frequency of hunting Wattled Brushturkey birds varies considerably between the two villages. The results showed that most of the people of Sigim Village (50%) did not necessarily hunt in a month, whereas in Sinatousi Village (50%) only did hunting less than 2 (two) times in a month. The villagers of Sigim only hunt at low frequency presumably because the location of hunting sites in Sigim is far away from the settlements, or, maybe, the Wattled Brushturkey population in Sigim Village is relatively smaller than that in Sinaitousi Village.

The number of respondents hunting more than 3 times a month was 2 families or 20% families in Sigim Village and 4 families or 33.3% in Sinatousi Village. This indicates that there is still demand food originated from Wattled Brushturkey and the birds are still available in nature although their presence at this time is far from the village.

**Hunting time**

The hunting time performed by the people of Sigim Village and Sinaitousi is relatively uncertain, but usually, the hunting of Wattled Brushturkey is done in the morning until late afternoon. This is related to the pattern of Maleo bird activity which is a diurnal animal so that the fitting of the traps and the use of trained dogs based on footprints or scattered food scraps will facilitate the hunter in the fitting of the snares. The hunting using snares is generally done in the morning or late afternoon, when the morning birds will come out of rest and in the afternoon when they will return. In general, hunters leave from kampong to hunting location between 05.00 o'clock and return home at 18.00 Middle Indonesian Time.The length of hunting activity depends on the location of hunting. If the hunting location is far from the village, usually they spend the night in a hut made at the hunting location. The hut as a resting place for hunter at the hunting site can be seen in Figure 6.

**Table 5.** The number of hunters in Wattled Brushturkey hunting team by Sigim and Sinaitousi villagers of Arfak Mountains, West Papua, Indonesia

| Hunting members | Number of heads of family | | Ratio (%) | |
|---|---|---|---|---|
| | Sigim | Sinaitousi | Sigim | Sinaitousi |
| Individual | 2 | 4 | 20.0 | 33.3 |
| Group | 8 | 8 | 80.0 | 66.7 |
| Total | 10 | 12 | 100.0 | 100.0 |

**Table 6.** Frequency of hunting for Wattled Brushturkey by Sigim and Sinaitousi villagers of Arfak Mountains, West Papua, Indonesia

| Hunting frequency (month) | Number of heads of family | | Ratio (%) | |
|---|---|---|---|---|
| | Sigim | Sinaitousi | Sigim | Sinaitousi |
| ≤ 2 time | 3 | 6 | 30.0 | 50.0 |
| 3-5 time | 2 | 3 | 20.0 | 25.0 |
| > 5 time | 0 | 1 | 00.0 | 08.3 |
| Uncertain | 5 | 2 | 50.0 | 16.7 |
| Total | 10 | 12 | 100.0 | 100.0 |

**Figure 5.** Location of hunting in primary forest

**Figure 6.** Huts resting place in the forest

**Figure 7.** Trapped bird of Wattled Brushturkey

**Results of hunting**

The people of Sigim Village and Sinatousi do not choose Wattled Brushturkey based on gender and age; the most important is the number of birds. This is because, with hunting methods such as installing traps or using trained dogs, it is very difficult to choose the target to be captured. A Wattled Brushturkey caught with the snares method is shown in Figure 7.

The average number of birds obtained by the villagers of Sigim and Sinatousi every time they hunt is 2-6. This result usually increases especially in the breeding season of the animal. Nevertheless, hunters in both villages found it harder to hunt at the present time than previously, as indicated by the decreasing number of game results; this is in line with the results of studies by Manik (2008) and Manik and Kilmaskossu (2013), which found the decline of Wattled Brushturkey bird population in the CAPA region as evident by the discovery of many damaged and unused nests.

Sigim and Sinatousi villagers generally only consume meat and eggs to fulfill the family's nutritional needs, but during the breeding season when there is demand for eggs and there are extra eggs, the eggs will be sold to supplement family income. The price of an egg at the time of study was Rp. 50.000-100.000. The price of eggs was relatively expensive according to hunters due to the difficulty in getting the bird's eggs at present.

Currently, the processing of meat and eggs, especially bird meat is very simple, namely boiling and frying it directly, but when there are extra meat and eggs, then the eggs or meat are preserved through the curing/*diasar*. This preservation process is rarely done because in general the meat and eggs are directly consumed or consumed later.

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