

Local wisdom and conservation effort of momoa bird (*Eulipoa wallacei*) in Galela coastal communities, North Halmahera, Indonesia

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Abstract

The research was conducted in Galela and North Galela, North Halmahera. The aims of this research were to know 1) the existence of Momoa bird and form of local wisdom to protect its existence; and 2) how the society protects the Momoa bird as a conservation effort. The respondents were divided into 3 groups as follows: the location owners, the egg's diggers and the local community. The owner's location and the egg diggers determined by the snow ball method, meanwhile for the local community using simple random method. Local wisdom information was collected by focus group discuss method and other data were collected by structured interviews using questionnaires. The results showed that local wisdom for Momoa bird protection has been known since 1910, but is disappeared. The results showed that 67.69% of the respondents did not know that the Momoa bird is endangered animal; even 73.86% of the respondents did not know that there was local wisdom to protect the Momoa bird; and there are 80% of respondents initiated to support if local wisdom is rearranged to protect the Momoa bird. Meanwhile, the egg's diggers and village leadership apparatus should be involved in local wisdom arrangement of preservation of the Momoa bird.

Keywords: Momoa bird, local wisdom, coastal communities, conservation, Galela

1. Introduction

Indonesia is a tropical country that has natural biodiversity of fauna species, especially for bird species diversity. Indonesia has about 1.500 species of the world's 8700 species of birds; it puts Indonesia on the third rank after Colombia and Brazil who has 1.531 bird species. However, the bird's life was threatened by human activities like hunting and destruction on their habitat. In North Maluku, Halmahera Island is the main island that covers the largest part of wild life, with 210 species of birds. There are 26 species of endemic birds reported in the Maluku Islands, 24 of which are located in North Maluku (Sapsuha 2013). Momoa bird (*Eulipoa wallacei*) is an endemic bird in Maluku and North Maluku, namely Halmahera, Meiti, Ternate, Bacan, Buru, Boano, Seram, Ambon, and

Haruku. This species lives in tropical mountain forests at an altitude of 750-1650 meters but spawn on sandy beaches exposed to sunlight (Saiya, Verboom, dan Heij 2016).

The biggest threats of biodiversity matters are habitat destruction or loss, and the best way to protect biodiversity is to preserve and maintain habitat. Currently, habitat destruction is generally a result of fulfilling the needs of human life. Nevertheless, human interest regarding to nature somehow can cause to maintain a preservation culture to conserve nature itself. The existence of protected species that have cultural value sometimes gives advantages on the conservation of species concerned (Warsito dan Yuliana 2007). Galela people exploit birds and eggs as a protein source for daily consumption and as a source of income. The biggest threat of Momoa birds' existence in their habitat is human activity such as destruction, overexploitation, and egg retrieval excessive that can reduce the number of bird populations, habitat quality and environmental fragmentation in the nesting location (Sapsuha et al. 2017).

Excessive destruction of habitat and exploitation has placed Indonesia in the country with the longest list of endangered species in the world include 126 bird species, 63 mammals and 21 reptiles. If not managed properly, the birds of Momoa (*Eulipoa wallacei*) will be extinct as well as other fauna (Astirin 2000). The other major issue on the existence of Momoa bird is the habit of the local community who uses birds and eggs as a source protein for daily consumption and livelihoods. The biggest threat to the survival of Momoa bird egg retrieval is excessive, potentially reducing the number of bird populations and accelerate the degradation of habitat and environmental degradation in nesting sites (Sapsuha et al. 2017). The study of Patty and Dilago (2018), indicates similar conditions related to this matter that the numbers of bird eggs which have collected each day for sale and consumption are in range of 4-25 eggs per collector, however, these still dependent on the diggers' location.

Even though the previous studies conducted on momoa birds have been reported, somehow there is no information about the social conditions, local wisdom and willingness of momoa bird conservation. Therefore, this research has focused on the existence of local wisdom, the willingness of momoa bird conservation and society's initiative to conserve the momoa bird. Another Research on local wisdom has been conducted on the island of Haruku, Maluku Province, but in North Maluku only conducted in Simau Village. This research more focused on the existence of local wisdom as well as the willingness and effort of the community to bring out the conservation of Momoa birds with a wider location covering 7 villages in 2 sub-districts in Galela region. The research purpose is to know 1) the existence and the form of local wisdom about momoa bird protection and, 2) how society enthusiasmt to conserve the Momoa bird.

2. Momoa Bird Status

Momoa bird population status was protected by Ministerial decree of Agriculture of the Republic of Indonesia number 757/Kpts/Um/1979 dated on December 5, 1979, but there is no decree to protect its location or eggs in Galela, North Halmahera, from extinction (Sapsuha et al. 2017). The present status of the bird on the IUCN (International Union for Conservation and Nature) list is 'vulnerable to extinction' (Saiya et al. 2016). Momoa bird (*Eulopia wallacei*) has spread over several islands, i.e. Halmahera, Meiti, Ternate, Bacan, Buru, Boano, Seram, Ambon and Haruku. The species lives in tropical mountain forests at an altitude of 750-1650 metres but lay their eggs on sun-exposed sandy beaches.

Heij & Rompas, (1999), describe the shape of the momoa bird as follows: The front of the head and neck is grayish, greenish brown; back head is light brown; neck and back top is greenish grayish with black; the center of the back, wings and external nets of some dark castaneous tertiary and most of the edge of the slate colored fur; upper tail feathers, chest and stomach are gray; small feathers, tertiary and brownish-green chocolate tails; the middle of a clean white stomach; black, brown, or spotted on the outside web is partially constrained by grayish white. The beak is yellow Beak; horned or black legs. Length 330 mm, 190 mm wings. This bird is different from other types of megapodes because of the diversity of color, a peculiarity that causes a lot of attention.



Figure 1 and 2. Momoa Bird in Mamuya Village (photo: Latupapua, M.J)

Heij and Rompas (1999) explain that the eggs' color are generally "rust-red", or like dark meat and honey-colored eggs. Further, they also explained that the longer in the hatching, the eggs' color will be more fade. They also explained that the momoa birds do not exhibit sexual dimorphism. Generally in the literature there is limited information and mostly based on the cursory observations and catching of the birds. Furthermore, this kind of bird is timid and hard to find. This fact is proved by a collection of museums consisting of only female animals, which has collected from spawning sites, indicating that little information can be found about its main habitat, therefore, the assumption is momo birds are inhabitants of tropical mountain forests, likewise on the case of other megapodes species.



Figure 3. Momoa egg size with egg laying chicken (Photo: Patty. Z)



Figure 4. Momoa eggs wrapped with pandanus leaves (Photo: Patty. Z)

3. Methods

3.1. Study area

This research was conducted in Galela and North Galela, district of North Halmahera. Based on pre-survey and previous study, we determined our research location by designed in which can be states that it is the momoa bird's egg-laying habitatas in the following villages: Barataku, Towara, Toweka, Limau, Simau, Mamuya and Soasio. The locations of these villages are shown in Figure 4.

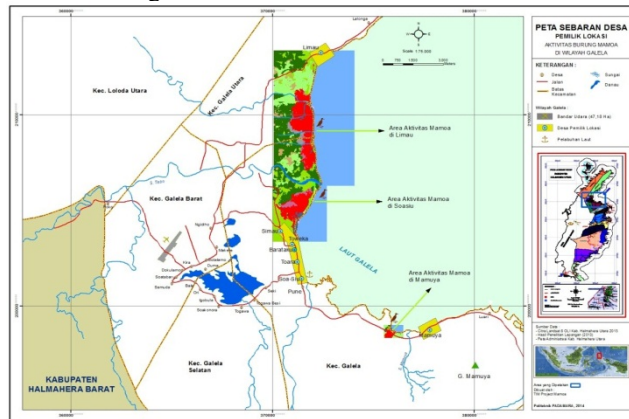


Figure 4. Survey area map

3.2. Data collection and analysis

Respondents were divided into 3 groups as follows: landowner, egg diggers and the local communities. Determination of respondents on landowners and egg diggers using snowball method, on the other hand for local community using simple random method. Data was collected from structured interview using a questionnaire. There are 14 respondents for landowner, 9 for egg diggers, and 42 respondents for local communities who live around momoa bird habitat. Data on the existence of local wisdom were collected through focus group discussions (FGD) with landowners and egg diggers, while data on knowledge and enthusiasm to protect the momoa birds was collected through in-depth interviews with questionnaires. Based on the interview data, we analyzed descriptively qualitative and quantitative, used : mean, standard deviation, minimum and maximum value, dan percentage (Conrad et al. 2017), and analysis data is showed in table or graphic.

4. Result and Discussion

4.1. Location Overview

The research area is located in Galela and North Galela sub-district, part of North Halmahera District, and located in coastal areas. Wide area of Galela sub-district administratively is 138.7 km² and North Galela is 255.3 km². Thus, the area of both sub-districts is 394 km². Currently, Galela sub-district consists of 7 villages, while North Galela sub-district consists of 12 Villages. Generally, villages in Galela and North Galela sub-districts are classified into swadaya village categories, except for the Simau Village in Galela sub-district belonging to the swakarya village. The mainland areas of Galela and North Galela sub-districts are dominated by lands with wavy topography to mountain slopes of > 8%. Topography is one of the decisive factors in land conformity assessment, which is related to slope and altitude factors from sea level. Galela and North Galela is an area of tropical islands (Anonymous 2013).

4.2. Profiles of household respondents

Definition and descriptive statistics analysis of household respondents is shown in table 1 bellow

Table 1. Definition and descriptive statistics of respondent households

Variables	Mean	Std. dev.	Min-max values
Age Respondent	47.69	10.883	24 -76
Sex Respondent	.91	.292	
Household size (number of family members)	5.12	1.709	2 - 10
Household education			
number of schooling child	2.08	1.229	0 - 5
Elementary students	1.51	1.091	1 - 4
Junior high students	1.11	1.161	1 - 4
high school students	1.05	1.067	1 - 5
college student	.57	.809	1 - 3

Source: primary data, processed

4.3. Local wisdom to conserve momoa birds

The result of interviews showed that the form of local wisdom related to the existence and protection of Momoa bird in Galela and North-Galela sub district are available in the form of village law and customary rules that have existed since long time ago. In addition, based on the interviews, there used to be a rule in the Barataku Village created in 1910 by the parents of Djuba family named “*Tete Djuba*”. The rules regulated:

- 1) Prohibition to cut trees surrounding the momoa birds egg-laying’s location
- 2) Prohibition to carry light or making fire at night at the egg-laying’s location.
- 3) Prohibition for fishing in spawning season at surrounding area of egg-laying’s location, fishing will be allowed after spawning season;
- 4) People who enter or fishing at egg-laying’s location must do “*Ngase*” or give contribution to village apparatus or landowners.

According to an interview with Haji Solahudin Haler from Limau Village, the same rule was applied in Limau and existed until 1980. Some points were regulated in village rules as follows:

1. Villagers were prohibited to pass at the egg-laying's location of momoa bird during afternoon to morning time (between 18:00 PM to 06:00 AM)
2. If the villagers were caught at catching momoa birds, they will be punished based on customary law namely, first was money penalty (undetermined price) and second based on sharing agreement of the amount of eggs-harvest per night.

The rules that existed in Barataku and Limau Villages were valid until 1960s but no longer exist now. Unfortunately, the survey showed that only 26.15% of the communities, especially the landowners and egg diggers knew the rules that once existed, while others have never known the existence of that local wisdom. Data of respondents' knowledge and understanding related to the existence of rules can be seen in figure 5.

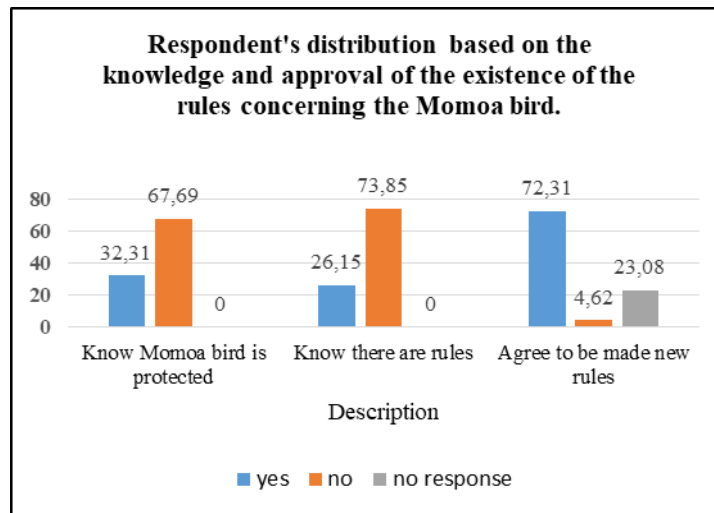


Figure 5. Respondent's distribution based on the knowledge and approval of the existence of the rules concerning the Momoa bird.

The data show that 67.69% respondent do not know that the momoa bird is a protected species of wildlife, even lack of knowledge of momoa bird's protection rules. Only 32.31% are knowledgeable about the rule, particularly landowners, egg diggers and their families or relatives. However, proper knowledge on wildlife species on the one hand could enable public to better appreciate and enjoy wildlife, on the other hand could encourage public to protect and conserve it, particularly for the threatened species. By the absence of such knowledge affected to public satisfaction on wildlife maybe low even zero notably to unknown / nameless species by the public. As a matter of fact, economic and other values recognized by the public dealing with unknown wildlife species tend to be lower than otherwise. Furthermore, increased appreciation of wildlife, especially threatened species, leads to greater support for their conservation and increases the memberships of organizations that help protect and conserve wildlife (Wilson dan Tisdell 2005).

For drafting of new rules to be part of village's regulation or other local rules, most respondents agree and support those matters, except to 3 respondents who stand to disagree. The rest of respondent are abstainer consider that the affairs of momoa birds should be handled by the village apparatus or the landowner. The biggest support provided by the community is very important for the sustainability of momoa birds. Wilson & Tisdell, (2005) emphasize that without public support for bird conservation in Australia many bird species will continue to disappear. An understanding of the extent of the public's knowledge of birds, and which species are likely to be supported by the public given their current knowledge, is useful in addressing some of these threats.

The rules on egg sharing apply among families, owners and eggs diggers have validated since Tete Djuba passed away. Normally the momoa eggs share by families by way of sharing in turns between families, which they call "arisan telur" (social gathering) among families, while egg shared between the owner and the egg diggers is usually done when the owner empowers the egg diggers to collect the Momoa eggs at the site. Usually the eggs are shared between the owner and the egg diggers, if the collected eggs are even numbered, but if the odd number, the diggers will get more one grain. Distribution of respondents by how to distribute eggs can be seen in the Figure 6 below:

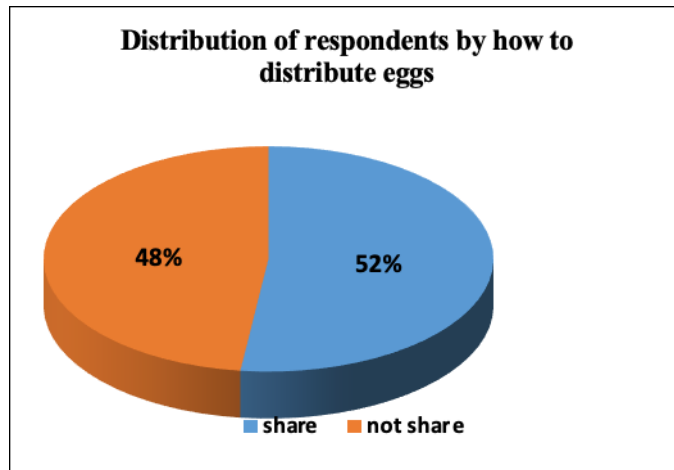


Figure 6. Distribution of respondents regarding eggs distribution

The interview results show that 52.17% of respondent still share the eggs collected, and the others is no longer. This condition is very dependent on the agreement of egg diggers and landowners, usually some landowners assign eggs diggers, while the other owners are directly involved in collecting the Momoa eggs.



Figure 7 and 8 . Interview activity in Mamuya Village (Photo: Patty, Z)

4.4. Willingness of conservation implementation

Knowledge of conservation is collected by interviewing respondents of landowners, egg diggers and villager. Interviews result show that 69.23% of respondent had ever heard the term of “conservation”, and only 30.77% of respondents who have never heard about it. On the one hand, even though a lot of respondents has heard this term, it turns out that only 13.85% of respondent who understand the meaning of the term “conservation”, and on the other hand, 86.15% of respondent do not understand the meaning of the term, including the landowners and eggs diggers of Momoa bird.

However, after brief explanation, 80% of respondents were willing to take part in conservation efforts. On the vice versa there are 1.54% of respondent refused to take a part and the rest of 18.46 % did not make any choice (abstain). In addition, the difference opinion about the conservation issue, the communities also have different opinion about the most entitled parties as conservation implementers.

The most entitled parties to carry out conservation efforts, interview results showed that 27.69% of respondents in the study site considered the village leadership apparatus together with the villagers is the most entitled to implement the conservation of Momoa birds. 13.85% respondent assume the landowner together with village leadership apparatus and villagers being the most entitled to implement the conservation of momoa bird species, while 18.46% of the respondents did not response and thought that during this time the Momoa birds are more taken care of by the landowner, so they have no right to interfere. Although public opinion is quite varied, however, some parties such as landowners, including eggs diggers and village leadership apparatus and villagers are the most entitled to conservation, whether jointly or by each party. This option because the location is owned by certain families but its existence as part of the village area.

Cooperation among the various parties above, become important for preservation of momoa birds. This is support the opinion of Saiya et al. (2016), which states that to preserve those endemic birds, cooperation is needed from various parties, but the active role of local community is the most important because of local people are people who live side by side with the endemic birds.

To involve the community such as the landowners, the diggers and villagers, need to consider the crucial factors that will determine the success of efforts to preserve the momoa bird, some aspects need to be considered such as the different level of community education, socioeconomic conditions of society, culture and customs. In dealing with those factors above before come to communities' involvement in society conservation program should be preceded by society development related to and dealing with the differences aspects of every social condition at grass root level as mention above. Counseling and mentoring programs are two important things in community development, by those preceding program various materials of social development can be submitted to the society, in addition, mentoring efforts should be done in order to guide the society to formulate rules, programs and plans are needed by the village related to their roles and participation in conservation of Momoa bird species will be done by proper information risk and compensation

On the economic aspect, the main factor to be dealt is income. Related with conservation efforts, the landowners and the egg diggers will certainly lose a percentage of their income that received from selling of Momoa eggs. In this case, even though they consented to implement the conservation of Momoa bird species, some respondents, owners and diggers have not understood the conservation impact toward their loss from the selling of Momoa eggs.

The results of the interview found that 73.91% of respondent from the landowners and the egg diggers understood that the implementation of momoa bird conservation could be impacted to reduce the number of eggs harvested and consistent in reducing their income from selling the momoa eggs.

Although number of people who understands that they should reduce the number of eggs is quite large, but about the number of eggs and income that should be reduced, some respondent has different opinion. The results also showed that 47.83% respondents really understood the benefits and consequences of the momoa bird conservation implementation agree to take only half number of eggs of total number they usually found. While respondent who approved the reduction of eggs by third part is about 8.70%. Furthermore, 21.74% of respondent agree for quarter of the egg reduction, because they did not want to lose the income from the considerable number of eggs. The remaining, 21.74% of respondent argued that whatsoever amount of eggs should be reduced they will obey depend on the outcome of drafting rules prepared, if the momoa bird conservation efforts are implemented. The loss income risk in the communities due to the conservation efforts of the momoa bird species needs to be concerned by the conservation implementers, including the local governments, in doing so when conservation efforts can be considered for local governments to grant compensation or incentives to landowners and diggers who will lose their usual income. Provision of compensation or incentives may be granted based on Government Regulation Number 8 of 1999 on the Utilization of Wild Plants and Animals. The regulation has been regulated on the provision of incentives for communities in the effort to conserve the types of plants and wildlife that are located around the community site. In addition, the responsibility for providing incentives to communities is also emphasized in the national strategic conservation directive of 2008 - 2018, states that the government needs to provide awards and incentives to members or groups of traditional or local communities that conserve species and maintain traditional wisdom (Anonymous 1999).

These incentives can be made by involving landowners and diggers as part of conservation management. Landowners and diggers can live with their usual activities as collecting eggs in this case but at the same time maintain conservation purposes. The collected eggs will be handed over to conservation site managers, and they get an incentive worth of eggs that are delivered at the same price if they sell to the market. Thus, owners and diggers involved in conservation do not risk lose their income because of conservation of the Momoa bird species.

5. Conclusion

The research concluded that the people in Galela and North Galela sub-districts used to have local wisdom about the protection of momoa birds, which applied almost identically to all villages surveyed. The community also supports a rearrangement that can protect the life of momoa birds, by concerned to the existence of landowners and egg diggers who have been trying to protect momoa birds for so long. To protect the momoa birds, the local government is also

urged to pay attention to social values in the community and grant the compensation for all those who suffer from loss of income due to the implementation of the momoa bird conservation efforts.

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