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Farmers' Perception on Grey-headed Lapwing (*Vanellus cinereus*) Existence in Paddy Field Surrounding Gifu University, Japan

Sofa Nur Azizah[1]*, Masateru Senge[1], and Zuhud Rozaki[2]

[1] Faculty of Applied Biological Science, Gifu University, Japan
[2] Department of Agribusiness, Universitas Muhammadiyah Yogyakarta, Indonesia

*Correspondence: E-mail: sofa.nura@gmail.com

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ABSTRACT

In agriculture practices, besides animal, human activity belongs to the enemy of Grey-headed Lapwing (*Vanellus cinereus*). This study aims to analyze the farmers' perception on Grey-headed Lapwing existence in paddy field surrounding Gifu University, Japan. There are 10 farmers who are work in the research area. All of them are farmers. Descriptive method was used in this study, the data were collected with questionnaire. The finding show that farmers ignore the existences of Grey-headed Lapwing. They saw the nest of Grey-headed Lapwing in unplowed area as many as 60% and they found the nest in plowed area (soil tillage) as many as 40%. Although Grey-headed Lapwing has great defense to attack the enemy, but they prefer breeding in safety place. In this case, when human activity do their work in soil tillage period, it can ruin the nests. It means that human activity is one of the factors that influencing the breeding success of Grey-headed Lapwing.

1. Introduction

Agricultural systems vary widely in their ability to support biodiversity, with many species extirpated from some but sustained in others. Additionally, characteristics of the species themselves, evolved over millions of years, may predispose some lineages to benefit (or suffer) from human environmental impacts **(Frishkoff *et al.*, 2014)**. Biodiversity is the diversity among living things from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological. The part of biodiversity was includes diversity within species, between species, and ecosystems. Recently, the taxonomic diversity of birds is limited.

Grey-headed Lapwing (*Vanellus cinereus*) was resident throughout the year, although very few individuals were observed in winter. In March 1991, the number of Grey-headed Lapwing increased suddenly, and then individually dispersed rapidly throughout the Nabeta reclaimed land **(Ohno, 1996)**. Grey-headed Lapwing is distributed from northeastern China to Southeast Asia **(Takahashi, 2008)**. In the 1950's, they were confirmed to breed only in the northern Kanto to the Tohoku Region. In Japan, the sporadically occur from northeastern to western Japan. Grey-headed Lapwing of the family order Charadriidae, which usually breeds in a loose colony on a plain or paddy-field, exhibits intense nest defense behavior and engages in communal anti-predator attacks when threatened **(Okugawa et al., 1970)**. Principally, this species are found in farmland and riverbeds in the lowland **(Takahashi, 2008)**. Grey-headed Lapwing feeds in shallow water mostly consist of invertebrates on or insects, worms and mollusks under the ground.

Grey-headed Lapwing has their own nest on the ground. This species make their own nests from April to July in wet grassland, rice fields and marshland edges. If in winters, this species looking for similar habitat and then gregarious. There is only one breeding Vanellus species **(Sonobe & Robinson, 1985)**. Territory size was also a factor affecting breeding success; territory area was positively correlated with the number of fledglings produced per nest **(Takahashi & Ohkawara, 2007)**. The Grey-headed Lapwing breeds in agricultural areas, particularly in fields for rice production **(Okugawa *et al.*, 1970)**. Tragically, Japan has already suffered a crisis of bird extinctions, with a number of species from its southern islands having been lost over the last two centuries **(Duffy, 2008)**.

During the breeding season, defense behavior by Grey-headed Lapwing parents for their nests or their chicks becomes more intense. When predators (such as Crows, raptors, dogs, and other predatory animals) approach their nests, both parents aggressively fly at and attack the predators, while emitting loud alarm calls. Parents often gather with neighboring adults, and together attack predators until they retreat **(Okugawa *et al.*, 1970)**. Grey-headed Lapwing is benefiting environment through eating the left over paddy in the field, and this bird also become indicator that the environment is still good for living things can live.

As human-converted habitats expand over earth's surface, the fate of global biodiversity will depend increasingly on the quality and characteristics of farming landscapes. Each human has different attitude and personality. Personality is defined by **Schiffman (2008)** as that the unique dynamic organization of characteristics of a particular person, physical and psychological, which influence behavior and responses to the social and physical environment. Each person has different attitude especially for maintaining the environment. Behavioral factors also affect the breeding success of lapwings. Human activity was one the factors which influence of the breeding Grey-headed Lapwing, whether it has significant relation between the breeding or not. Human impact on dune breeding birds need to be quantified in order for recommendation to be made to minimize such impact **(Watson *et al.*, 1996)**. Breeding area is one of important thing of Grey-headed Lapwing, that is why the breeding area on farmland surrounding Gifu University as the area which has many human activities there need to be observed.

Based on the background as mention above, the location of this research where take place surrounding Gifu University, Japan. The objective of this research is to observe the breeding area of Grey-headed Lapwing on farmland and the farmers' perception on this.

2. Methods

2.1 Study Area

This study was carried out surrounding Gifu University, Gifu City, Japan purposively due to the area that easier to be monitored and observed. It was held from March to August 2014. Total area is 7.68 km^2, 35º27'45.05"N, 136º44'23.91"E. The study area consisted of rice fields, wheat fields, vegetables crop, fruit plants and fallow land (Figure 1 and 2). Most of the locations are alluvial soil.

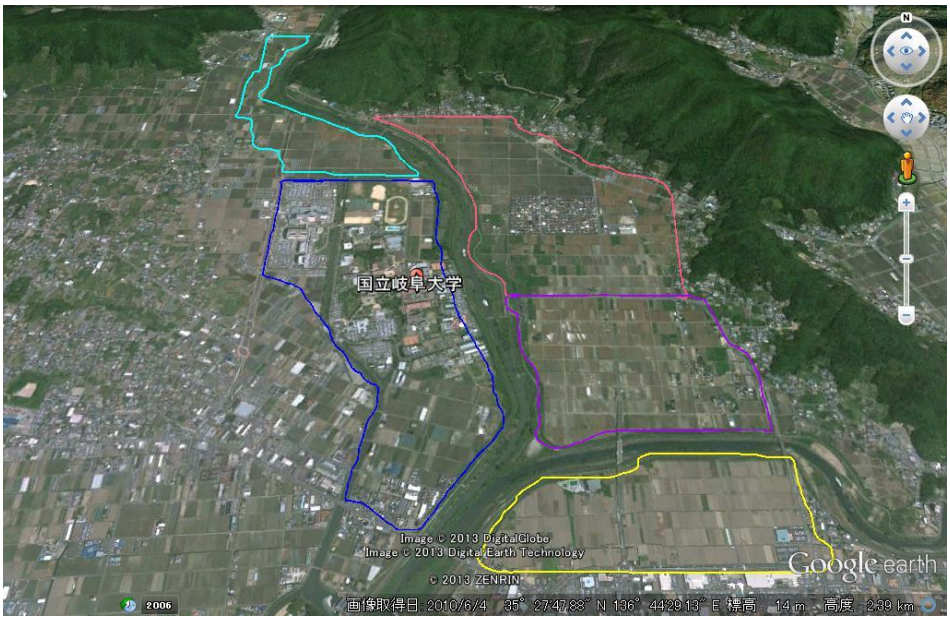

Figure 1. Study Area

Figure 2. Location of Study

2.2 Data Collection and Sampling Procedure

The basic method of this research is descriptive method which describes the condition of the birds and human activities as the supported data. Analyzing data of Grey-headed Lapwing which was conducted by counting the distribution of bird and ignoring whether the bird was same or not. Besides that, the amount of nest prediction were counted from April to July. It was conducted to know the breeding area of Grey-headed Lapwing.

The basic method of human activities research was using descriptive method. It was done by interview with the farmer. From the questionnaire, can be used to describe the condition. In this study, this method used to know whether the human surrounding Grey-headed Lapwing was care or not about this species? Analyzing data by collecting the answer from questionnaire which conducted by interview.

The location of study was divided by five locations based on their characteristics, they are from already ploughed to not ploughed at all, and also from the distance of residents. To make easier of observe the distribution of Grey-headed Lapwing, the location was divided. For the observations, binocular and telescope were used. It was done accordance with research by **Takahashi (2007)** which mention that in the breeding stage, to avoid disturbing the pairs, it was observed from the car at the distances (usually 150m) with binocular and telescope.

Interview is a process of interaction and communication. In this process, the results of interviews conducted by multiple factors that interact and influence the flow of information **(Singarimbun, 2006)**. This interview was conducted by interviews with the farmer surrounding research area. The aim of interview was to know the relationship between human and animal. The data were analyze using descriptive method through percentage, pictures and mean. The questionnaire is closed questions.

The correlation between human and animal were analyzed, in this case, the animal is Grey-headed Lapwing. There are 10 respondents who involved in this study, they were selected purposively. They are farmer who have activities surrounding of Grey-headed Lapwing. Questionnaire and also picture of Grey-headed Lapwing were shown to respondents for supporting the findings. Some simple question already answered. As qualitative data, literature review also was conducted to support the findings.

3. Results and Discussions

3.1 Birds Location

Figure 3 shows about the average of birds' location. Grey-headed Lapwing breeds in agricultural areas, particularly in fields for rice production **(Ohkugawa *et al.*, 1970)**. The highest number of the average of birds' location is in puddle area. In this area, invertebrates on the ground was found. It was accordance by the research that was done by **Takahashi (2008)** that this species are found in farmland which consists of invertebrates on or under the ground. Besides paddle area, non-paddy area also has the high number (Figure 4). Non paddy areas consist of fruits, vegetable crop plant and fallow land. The smallest number was in harvesting period. It happen because agricultural machine is one of the external factor that disturbing the birds.

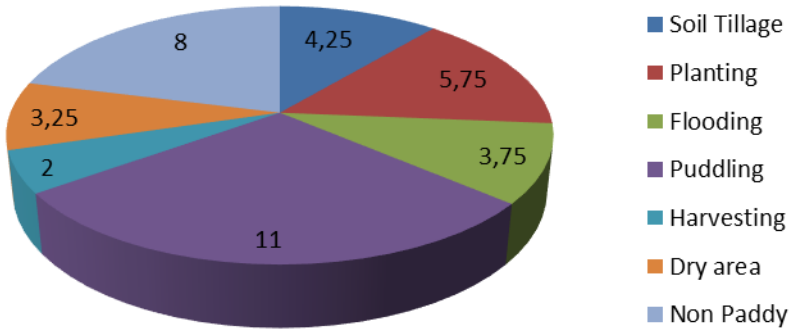

Figure 3. Average of Birds' Location

Figure 4. Grey-headed Lapwing in puddle area

Figure 5. Vegetables Crop Field

While the figure 5 shows the nest prediction's location. Actually, it also has the same result as the average of birds' distribution's location. The highest number was in puddle area. In distribution location of bird, rank number two was non-paddy area. But the nest prediction in soil tillage area as rank number two was found. It means that after the land field was plowed, the birds choose that place for breeding. It happens because in this area, the amounts of enemies are little. Especially in fallow land, this species feel safety. Human activities always do their work in agricultural area such as paddy field. They do not care about the land which not their land. They just concern about their land self. While another enemy like animal, they also need to feed their need. So, they always look for land which has so many foods.

Figure 6. Dry Area of Farmland

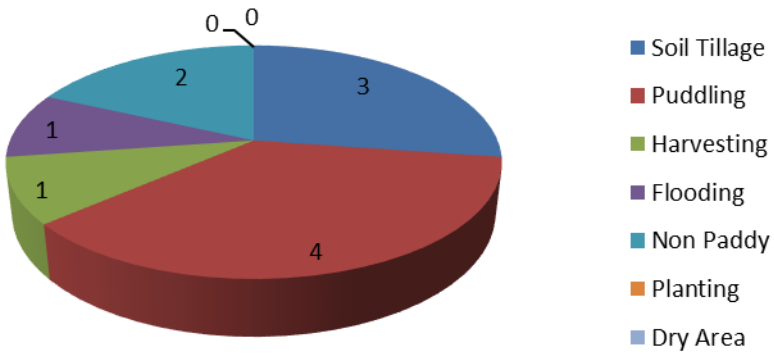

Figure 7. Nest Prediction's Location

Figure 8. Grey-headed Lapwing keeps the nest in non-paddy area

Figure 9. Flooding Area of Farmland

Figure 10. Grey-headed Lapwing after harvesting period

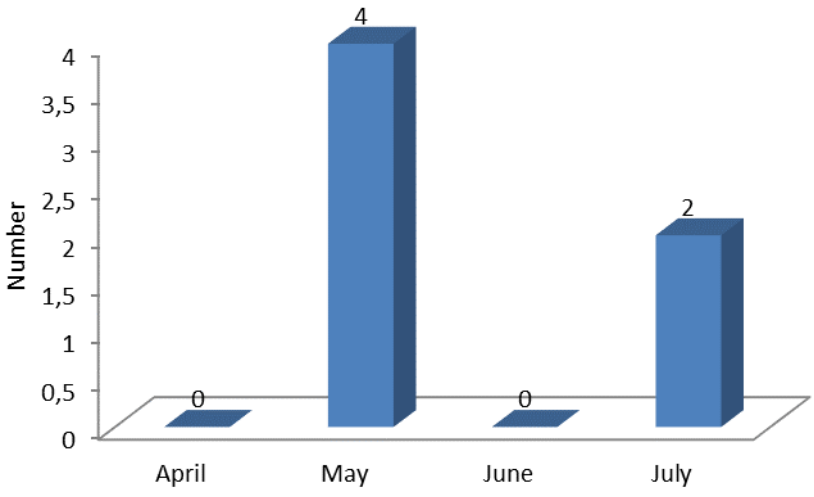

Figure 11. Amount of chicks

The aim of this research is find out the breeding area. As mention above, the result of birds' distribution and location of breeding were received. There are only 11 nests predictions which can predict. After breeding, the birds were hatching. In this research, 2 times of chicks were found. First, 4 chicks in location 3 were found in May. And 2 chicks in location 1 were found in July. Actually on August, some chicks also were found. But, in that period is only the additional time and not observe it every day. After hatching, they leave their nest to looking for some food by themselves. It was suitable with another research that was done by **Takahashi (2007)** which said the hatchling soon leave the nest and start to forage the food by themselves following their parent birds in the territory.

Figure 12. Grey-headed Lapwing

Figure 13. Chicks of Grey-headed Lapwing

Figure 14. Fledging period of Grey-headed Lapwing

Figure 15. Juvenile of Grey-headed Lapwing

3.2 Farmers' Perception

Based on figure 16, 17, respondents were asked whether they know or not about this species. When respondents were asked "Do you know Grey-headed Lapwing?" almost all of them did not know about this species. But, when the picture of Grey-headed Lapwing was shown, almost the respondents are known. Two farmers did not know. One of them is work in persimmon field and the other one, she worked in paddy field but did not care about the entire animal in the paddy field, except crow.

When respondents were asked “have you ever see the nest of Grey-headed Lapwing?” Some of the respondent said that they have ever seen the nest of Grey-headed Lapwing In this case, actually they know about this species but they just don not care about surrounding their activities.

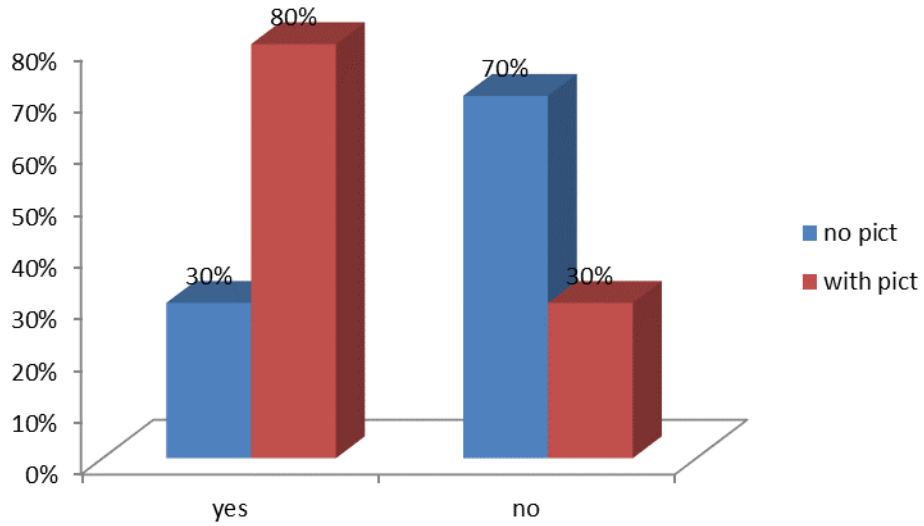

Figure 16. Understanding of farmer about Grey-headed Lapwing

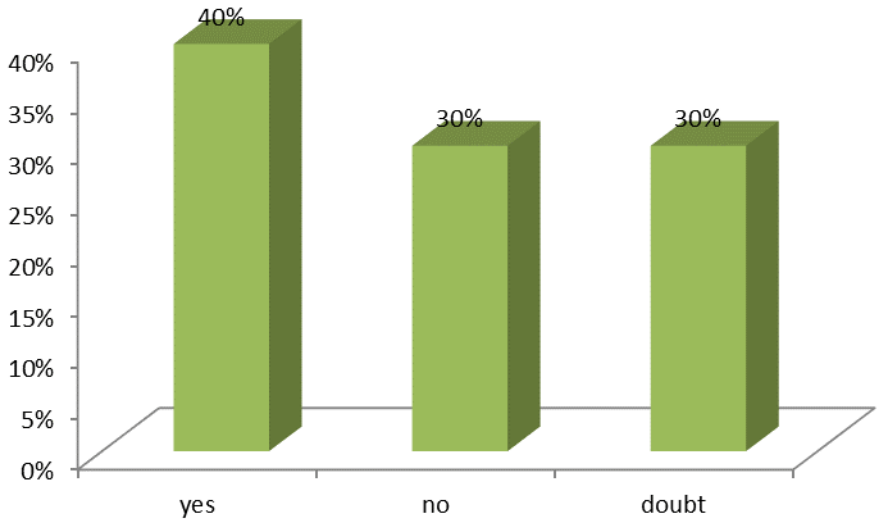

Figure 17 Understanding of farmer about the nest of Grey-headed Lapwing

Based on figure 18, the result shows that most of respondent saw the nest when they plow their land. It was hypothesized that unplowed area is the favorites place for the Grey-headed Lapwing to breeding. Other research said that Grey-headed Lapwing build their nest in wet habitats, such as paddy fields and low grass **(Takahashi, 2008)**.

Human impacts on dune breeding birds need to be quantified in order for recommendation to be made to minimize such impacts **(Watson, 1996)**. Human is the factor that influencing the breeding success of birds. Human has sympathy and empathy. Empathy is facilitated by the perceived similarity between the object and subject **(Prguda, 2014)**. In this case, if the human are protect the Grey-headed Lapwing, it will be help the breeding success of this species.

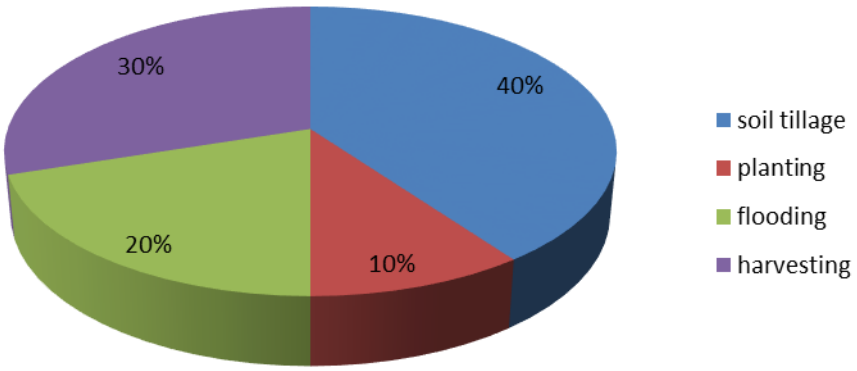

Figure 18. Location of seeing the nest of Grey-headed Lapwing

This research also observes the human activity surrounding the bird. It was done because the farmland is the place for Grey-headed Lapwing to breeding. Human reaction will be influencing the breeding success of Grey-headed Lapwing.

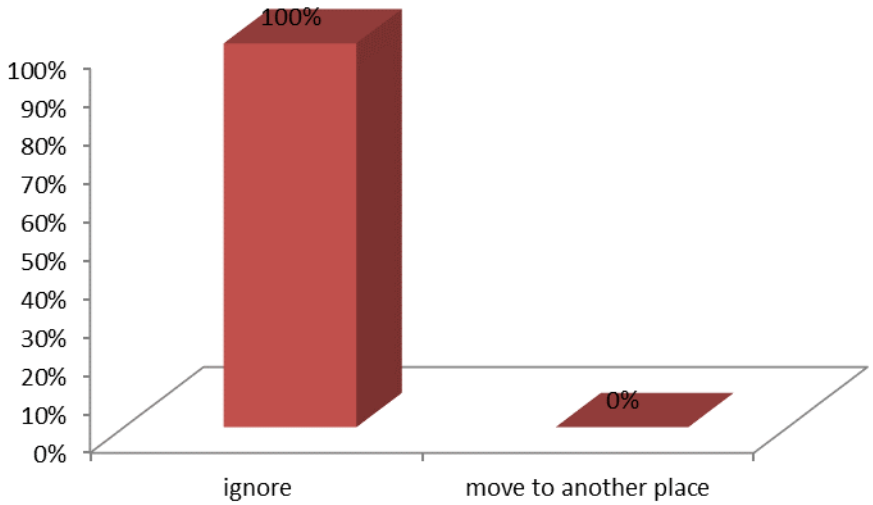

Figure 19. Respondent's reaction when finding Grey-headed Lapwing

Based on figure 19, when respondents were asked about what will they do if they find Grey-headed Lapwing? All of respondents said that they will ignore them. As far as this species do not bothering their activities and do not give bad impact for farmland. The habitat of Grey-headed Lapwing was in farmland but they do not eat those crops. They live in this kind of habitat because so many invertebrates on and underground. Grey-headed Lapwing found principally in farmland which consists of invertebrates on or under the ground **(Takahashi, 2008)**.

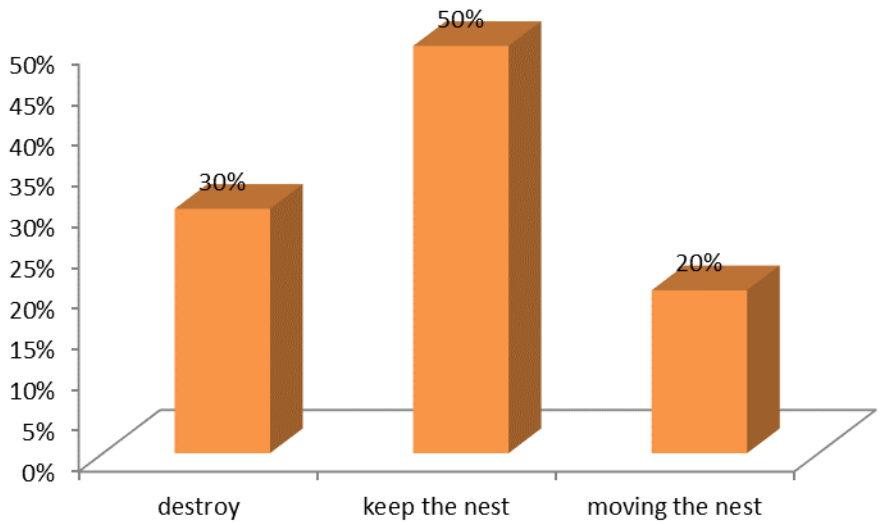

Figure 20. Respondent's reaction when finding the nest of Grey-headed Lapwing

After respondents were asked when they found the Grey-headed Lapwing, the reaction if they find the nest of Grey-headed Lapwing also were asked. In figure 20, some of the respondent (30%) will ignore the nest and half of respondents (50%) will keep the nest. It means that when they find the nest, they will not destroy their land. Because they thought that bird is same as human. They need to live. So, the human will move the activities in another place until the birds hatching. But, when respondents were asked about this kind of experiences, they said that they do not have such kind of experiences. It just shows that human has empathies **(Prguda, 2014)**. The smallest percentage (20%) of respondents will move the nest to other place. As we know that Grey-headed Lapwing has great defense behavior for keep their nest. The similar result was reported by **Ohno (1996)** that Grey-headed Lapwing defended their own nest sites with intense anti-predator attacks.

4. Conclusions

There are 11 nest predictions was found in different location. Location 1 has the biggest number of nest predictions. The biggest number of the average of bird location was found in puddle area. This result same as the location of nest prediction. The biggest number was also in puddle area. Some chicks of Grey-headed Lapwing in May and July. Over all, Grey-headed Lapwing prefers to choose unplowed area than plowed area for breeding.

Besides animal, human activity belongs to the enemy of Grey-headed Lapwing. There are 10 respondents who are work in the location of research area. All of them are farmers. From the questionnaire, the result that farmers ignore the existences of Grey-headed Lapwing. They saw the nest of Grey-headed Lapwing in unplowed area as many as 60% and they found the nest in plowed area (soil tillage) as many as 40%. Although Grey-headed Lapwing has great defense to attack the enemy, but they prefer breeding in safety place. In this case, when human activity do their work in soil tillage period, it can ruin the nests. It means that human activity is one of the factor that influencing the breeding success of Grey-headed Lapwing.

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6. Authors Note

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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