

Domestication of red jungle fowl: A case study of the red jungle fowl chicks procurement by the communities in Central Bengkulu, Indonesia

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Abstract. *Setianto J, Zain B, Sutriyono, Prakoso H. 2017. Domestication of red jungle fowl: A case study of the red jungle fowl chicks procurement by the communities in Central Bengkulu, Indonesia. Biodiversitas 18: 183-189.* The existence of the red jungle fowl is increasingly pressured by habitat destruction, illegal hunting, and predators' consumption which may result in an extinction. Conservation of the red jungle fowl had institutionally not been carried out both by the government and private institutions. However, the communities in Central Bengkulu District had done a domestication of the red jungle fowl. Until now, the conservation of the red jungle fowl in a community was not much studied. This study aimed to identify information about the origin of the red jungle fowl chicks, the origin of purchase of chicks, the equipment used for hunting and the chicks purity. Respondents selection was conducted by using a snowball sampling method. The data were obtained by using a combination of in-depth interviews, questionnaires, and a direct observation. The results showed that 38% respondents obtained the chicks from hunting, 40% from buying, 2% from hunting and buying, 6% from buying and conferral, and 14% from conferral. From respondents who did the chicks buying, 4.2% respondents bought the red jungle fowl from the traditional markets, 91.6% bought from hunters, and 4.2% bought from the chicks. Hunting activities were undertaken by 40% respondents, while 60% did not practice hunting activities. From respondents who did the hunting activities, 10% used a net, 30% used racit equipment and 60% used a combination of net and racit. Chicks obtained by respondents, 46% of the red jungle fowl and 54% of the offspring of the red jungle fowl. The red jungle fowl chicks were obtained from nature by hunting in the forests or plantations and from the surrounding communities, either by purchase or conferral.

Keywords: Chicks, domestication, hunting, red jungle fowl

INTRODUCTION

The red jungle fowl is a germplasm asset that lives in the wild and chicks in forests or in plantations in the province of Bengkulu. As germplasm, the red jungle fowl has a very important function for people in the surrounding habitat. Red jungle fowl has the function of ecology, economy, and aesthetics. The ecological function of the red jungle fowl is as a prey for a predator, its economic function is as hunted animal and genetic resources for domestic animals to produce more meat and eggs, and the aesthetic function of it is as an ornamental chicken (Setianto et al. 2015b).

The threats faced by the red jungle fowl include egg retrieval, hunting/capture, and habitat degradation (Akrim et al. 2015; Setianto et al. 2015a). The decreasing forest area due to land conversion, habitat destruction, uncontrolled hunting, and predation by predators are thought to be the cause of the decline of the red jungle fowl. The ongoing population decline could lead to extinction. The extinction of the red jungle fowl could lead to the extinction of burgo chicken. This is because the red jungle fowl is the ancestors of burgo chicken which are widely kept by the people of Bengkulu (Setianto et al. 2015b).

Until now, the research or the study on the red jungle fowl focuses more on kinship of red jungle fowl as the

progenitor (ancestor) of the current chickens and on its genetic characteristic (Azmi et al. 2000; Dorji et al. 2012; Moiseyeva et al. 2003; Mukesh et al. 2011; Mukesh et al. 2013; Sulandari et al. 2008), and also on its population, behavior, and habitat (Arshad and Zakaria 2009; Javed and Rahmani 2000; Subhani et al. 2010). On the other hand, the basic information about the domestication of the red jungle fowl by society is a very little, especially the information about how people obtain their red jungle fowl (Setianto et al. 2015a).

Institutionally, there is no special institution to manage and conserve the red jungle fowl, both government agencies, and private institutions. However, domestication as one form of conservation has been done by some people. Domestication of the red jungle fowl has long been done by the people in Central Bengkulu District. Red jungle fowl have melted with the lives of most people in Central Bengkulu District. Red jungle fowl are kept as a pleasure or as a producer of meat and eggs for their own consumption or for sale. In addition, the red jungle fowl are also taken care of to obtain new offspring by crossbreeding with local chicken.

Seeing these conditions, it is time to perform the keeping of the red jungle fowl ex-situ (outside their habitat). This is done to ensure the conservation and sustainable utilization of genetic resources of red jungle

fowl, including the availability of qualified chicks of red jungle fowl optimally and continuously. However, up to now, there is only a little study about the domestication of the red jungle fowl by the community, so the information about it is also limited. It is necessary for studies of the red jungle fowl domestication undertaken by the community to obtain more detail information. This information can be used to maximize the red jungle fowl conservation efforts through the protection of ecological processes as a life support, as the preservation of genetic diversity, and as the use of the red jungle fowl sustainably.

The purpose of this study is to identify the red jungle fowl domestication by the community in Central Bengkulu District, particularly with chicks of red jungle fowl. In this research, the identification of the origin of the red jungle fowl chicks, the place of the purchase of chicks, equipment used for hunting, and the purity of the chicks.

MATERIALS AND METHODS

The study was conducted in March-September 2016 in Central Bengkulu District, Bengkulu Province, Indonesia. Research location was determined intentionally (purposely) with the consideration that Central Bengkulu District is one of the red jungle fowl habitats and there are people who raise the red jungle fowl. Red jungle fowl is concentrated on forest and plantation areas, so these areas become red jungle fowl hunting place for the surrounding people. Central Bengkulu District administratively belongs to the province of Bengkulu province. Central Bengkulu District consists of 10 districts, 142 villages, and one urban community. The total area of Central Bengkulu district is

around 1223.94 km². Figure 1 shows the location of the research.

The sampled respondents are breeders who do the domestication of red jungle fowl. Sample selection is done by the method of snowball sampling. This method is done because the existence of breeders who domesticate red jungle fowl is not known clearly. In the first phase, sampling is done by finding a breeder domesticating red jungle fowl. The next stage of the sampling carried out in sequence, starting from the first respondent, and this respondent was asked to provide information about the other respondent who also domesticates the red jungle fowl at home and is considered authoritative to provide information. This process was repeated until the required number of respondents was fulfilled. This research acquired 50 respondents of the keeper of the red jungle fowl or its descendants.

Data taken and collected in this study are primary and secondary data. The primary data was obtained directly from the red jungle fowl keepers who were appointed as sample using a combination of in-depth interviews and asking a list of questions that have been prepared before (questionnaire). In addition, primary data were also obtained through direct observation and measurement in the field. Meanwhile, secondary data were obtained from some studies that have been done before. Such data can be obtained from the agencies or institutions that are closely related to the research on the red jungle fowl or obtained from the various literature. The data included the origin of chicks (buying, hunting, or conferral), the origin of chicks purchase, hunting equipment (nets, racit), and the purity of the chicks. Data were analyzed descriptively and presented in the form of tables and figures.

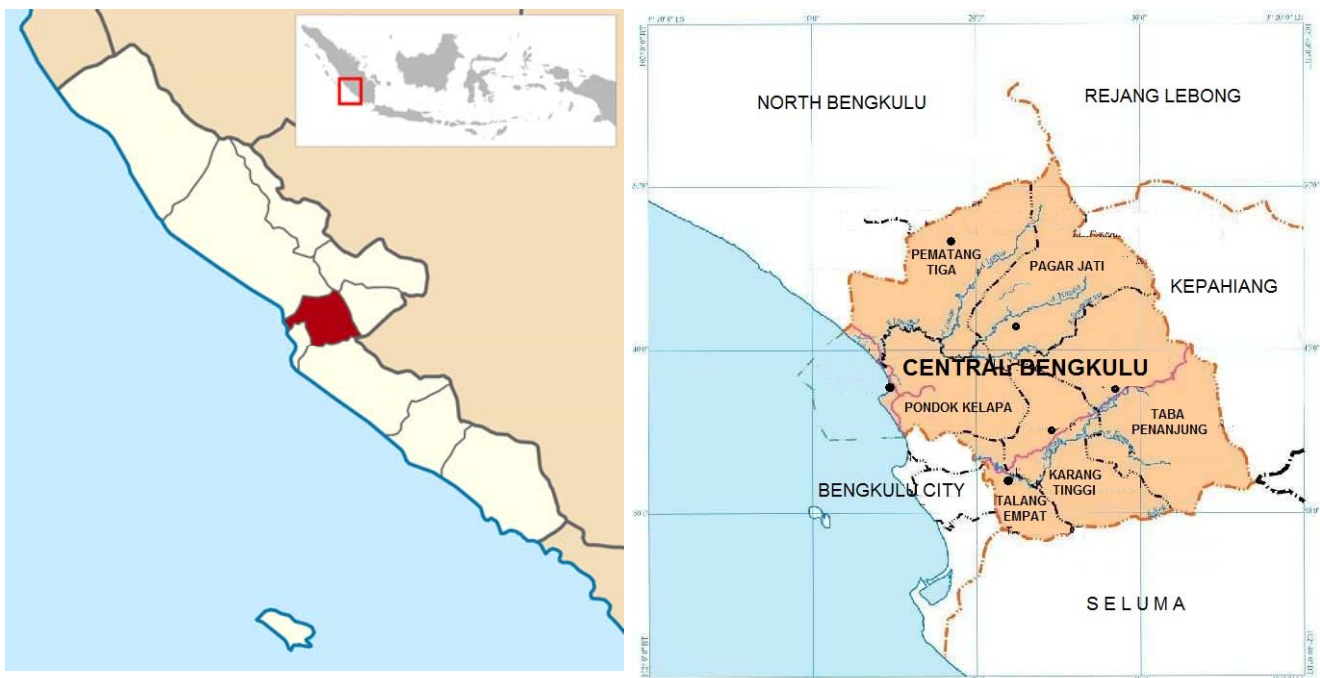


Figure 1. Map of Central Bengkulu District of Bengkulu Province, Indonesia as a study site

RESULTS AND DISCUSSION

The origin of chicks and the origin of the purchase of red jungle fowl chicks which are raised by the community

The origins of red jungle fowl chicks raised by the community were from various places. Generally, chicks of red jungle fowl are obtained from the area around the residence of respondents. Chicks were obtained from the hunting, buying, or the granting from a hunter or a fellow keeper of the red jungle fowl. The results in Table 1 show the information on the origin of red jungle fowl chicks which were taken care by the respondents.

Research results in Table 1 indicate that the origin of chicks of red jungle fowl are as follows: 38% of respondents obtain chicks of red jungle fowl from hunting; 40% of respondents obtain chicks from purchasing; 2% of respondents obtain chicks from hunting and purchasing; 6% of respondents obtain chicks from the purchase and conferral from others, and 14% of respondents obtain chicks from conferral. From these results, it can be seen that the origin of the red jungle fowl chicks mostly comes from hunting and purchases. Purchasing is a combination of three chicks' origin, namely buying, hunting and buying, as well as the buying and conferral. In combination, the origin of chicks from hunting and purchasing shows the largest percentage (86%) of the total origin of red jungle fowl chicks which are nurtured by the respondents. In Table 1, it can be seen that the number of respondents who buy chicks of red jungle fowl is 24 respondents (48%). Respondents who buy chicks of red jungle fowl are only 2% greater than the respondents who hunt. The great number of respondents who buy chicks to be nurtured shows a high number of interested people in nurturing the red jungle fowl. Meanwhile, respondents who obtained the chicks by conferral are only 14%, in addition, respondents who get the chicks from the buying and conferral are 6%. When the two are combined, it will get the total of 20%. The conferral of red jungle fowl chicks is usually done by a fellow red jungle fowl nurturer. Sometimes, the obtaining of red fowl chick is by giving it to each other between the hunter and the keeper of red jungle fowl, or vice versa, from the red jungle fowl keeper to the hunter.

With the amount of 48% of respondents who purchase chicks of red jungle fowl, it makes it interesting to study the origin of the purchase of red jungle fowl chicks. Until now, there have been neither farmers nor companies having the red jungle fowl chick production company at the study site. In Table 2, it can be seen that the origin of the red jungle fowl chicks purchases made by the respondent.

In Table 2, it can be seen that the respondents bought the red jungle fowl chicks from three different places, namely the market, hunters, and breeders. Of the three places, most respondents bought from hunters (91.6%). Meanwhile, the purchase of chicks from the market and breeders is lesser than the purchase from hunters, each is only 4.2%. From the results of this study, it can be seen that the main source of chicks of red jungle fowl in society is from the hunters. This is proved by a large number of red jungle fowl chicks purchase from the hunters. Based on these data, it can be said that the chicks of red jungle fowl

are still obtained from nature (forest). The chicks of red jungle fowl are obtained through hunting activities. Thus, the role of the hunters of red jungle fowl chicks in its procurement is very important. It is necessary to get attention considering that the red jungle fowl populations in forests decrease at all time. Conservation to maintain the population needs serious attention so as not to be late. It is also important to do efforts to improve the management of red jungle fowl breeding in order to produce good red jungle fowl chicks.

Hunting activities and hunting equipment for the wild red jungle fowls

Although hunting has a huge role to the procurement of red jungle fowl chicks in the community, not all respondents do hunting activities. This is because to do the hunting, the certain skills and time are needed, so not everyone can do it. It also calls for special equipment and decoy chicken for hunting purposes. The decoy chicken is a descendant of the red jungle fowl (F1, F2). The use of the red jungle fowl descendant is important because it is relatively more benign than the red jungle fowl which is always wild. The use of decoy is to lure the red jungle fowl out of its place. Decoy chicken is maintained and specially treated and trained for the purpose of hunting as a decoy. Decoy chicken is mostly not kept in the bottom of a cage, but by using a perch. The chicken was left stay on perch. This is done in accordance with the habits of the red jungle fowl which sleeps in the branches of trees in their natural habitat. In addition, decoy chicken is often tied up in an open area (in the courtyard) in the morning/afternoon to get some sun. Figure 2 provides an illustration of the decoy chicken for hunting being tied up in the courtyard and a decoy chicken is on the perch.

The number of respondents who do or do not do hunting activities on the red jungle fowl in nature can be seen in Table 3. Table 3 shows that out of the 50 respondents, there were 20 respondents (40%) who did the red jungle fowl hunting in the forest, while 30 respondents (60%) did not do the red jungle fowl hunting activities. Some respondents who did not do the red jungle fowl hunting activities in nature to say that they do not hunt because they do not have the skills or expertise to carry out activities of the red jungle fowl hunting. The hunting activities were usually done from late afternoon by installing hunting equipment. Later at night, they waited until morning. After sunrise, usually, red jungle fowl came out of its nest. At that time, hunters paid attention to the-already-installed equipment to trap the red jungle fowl. This hunting was still in the category of environmentally friendly since it did not damage the habitat and the red jungle fowl being hunted or captured were still in living conditions. Figure 3 provides an illustration of the hunting location, installation of racit equipment and racit that have been installed with decoy chicken.

Figure 3 shows the way to one of the red jungle fowl hunting locations in the area of oil palm plantations in Central Bengkulu District, away from residential areas. The location of the red jungle fowl hunting goes into the forest or plantations. In these areas, there are red jungle

Table 1. Origin of chicks of red jungle fowl obtained respondent

The origin of chicks	Number of respondents	Percentage (%)
Hunting	19	38
Purchase	20	40
Hunting and purchase	1	2
Purchase and conferral	3	6
Conferral	7	14
Total	50	100

Table 2. Origin of chicks' purchase of red jungle fowl are kept respondents

The origin of chicks' purchase	Number of respondents	Percentage (%)
Market	1	42
Hunters	22	916
Breeders	1	42
Total	24	100

Table 3. Total respondents who do the red jungle fowl hunting activities in nature

Hunting activities in nature	Number of respondents	Percentage (%)
Doing hunting activities	20	40
Not doing hunting activities	30	60
Total	50	100

Table 4. The equipment used by the respondent in the red jungle fowl hunting in the wild

Equipment for hunting the red jungle fowl in the wild	Number of respondents	Percentage (%)
Net	2	10
Racit	6	30
Net and racit	12	60
Total	20	100

fowls that live in the wild and pilulate. Figure 3 shows one of the hunters was installing racit equipment in the locations to trap the red jungle fowl. After racit was installed, decoy chicken was tied up and perched in the middle of a racit circle. Once completed, the hunter waited until the morning of the red jungle fowl to come out of the nest. At that moment, the red jungle fowl, which was usually male, would fight the decoy chicken and entered the bondage straps on racit. Other than racit equipment, respondents who did hunting activities also used a net to catch the red jungle fowl. Nets were stretched on site and a decoy chicken was used to provoke the red jungle fowl. The interesting thing was that the respondents in the studies

did not use any other equipment except that two tools only. The equipment used by respondents to hunt the red jungle fowl can be seen in Table 4.

From Table 4, it can be seen that at the time of the red jungle fowl hunting in the forest, the respondents did it in three ways, using nets, a racit, or a combination of both. Of the three ways, as many as 10% of respondents used the hunting nets, 30% of respondents used racit equipment, and 60% of respondents used a combination of nets and racit. These data indicate that more respondents used a combination of racit equipment and nets rather than just used a single racit or nets alone. Figure 4 illustrates the equipment used and how to use this equipment to hunt.

Figure 4 (a) shows the racit equipment and the already installed racit, while Figure 4 (b) shows the instrument nets and nets that have been laid to trap the red jungle fowl. Both of these equipment have a difference in getting results. With racit equipment, almost all of the red jungle fowl caught is male red jungle fowl. This is due to a fight between decoy chicken, which is a rooster, with red jungle fowl inside racit. And the nets equipment uses decoy too, but the nets can catch any red jungle fowl, namely male, female, or chick of red jungle fowl. Nets are stretched across the road which is estimated to be the route of the red jungle fowl.

Discussion

The red jungle fowl is a local genetic resource that has merged to the lives of most people in rural areas in Central Bengkulu District. Uddin et al (2013) said that the public has long been nurturing this local chicken on a small scale for a variety of purposes. Fernandes et al (2007) suggested that, besides as an ancestor of domesticated chickens, the red jungle fowl is also one of the most important species for mankind because it has economic and socio-cultural values.

The results of this study showed that chicks of red jungle fowl were obtained from several sources. Sources of red jungle fowl chicks are dominated by the ones obtained from nature by hunting. Provision of new chicks is limited for the use of farmers themselves. The effort has not been supported by the availability of chicks in sufficient quantity and quality. The quality of the chicks does not meet the criteria of quality, but it still depends on the outcome of the hunting activities. The chicks breeding of red jungle fowl carried out by the society in Central Bengkulu District has not met the criteria of good indigenous/local chicks breeding practices. In addition, the procurement of chicks carried out by the society in Central Bengkulu District is also different from the results of research by Okeno et al. (2011). The research results of Okeno et al. (2011) revealed that breeders make the selection of chicken at the household level based on the growth rate, the body size, the egg production, the hatchability and the good parenting ability, feather normality, crown feathers on head, neck bareness (legund), and the availability of giant genotype which is the most popular genotype among breeders. Another study conducted by Hanh et al (2015) shows that the survival rate of red jungle fowl chicks is high (around 84%).

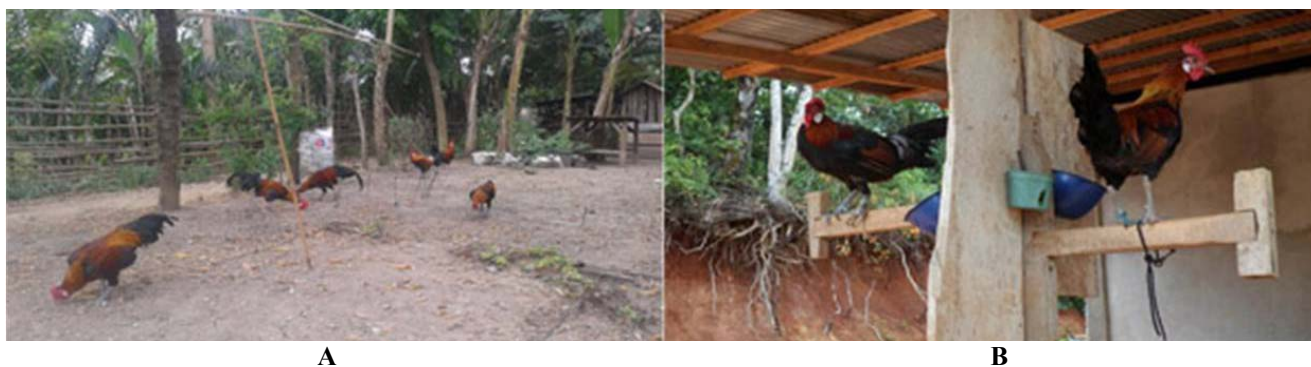


Figure 2. decoy chicken for red jungle fowl hunting. A. Decoy chicken is sunbathed under the sunshine, and B. Decoy chicken is perched



Figure 3. A. The road to one of the red jungle fowl hunting locations in Central Bengkulu District, B. A hunter installing a racit, and C. The installed racit with decoy chicken in it



Figure 4. Hunting equipment for catching red jungle fowl: A. Racit, B. Nets

On the one hand, the demand for red jungle fowl is quite high; on the other hand, the unavailability of chicks breeding is one of the factors for the fulfillment of red jungle fowl chicks is done by hunting in the wild. In fact, the activity of hunting can be one of the threats to the declining population and extinction of the red jungle fowl (Liang et al. 2013; Akrim et al. 2015; Setianto et al. 2015a). The results showed that 40% of 50 respondents do the hunting. In other research location, Setianto et al. (2015a) found that 65.22% of 46 respondents do the red jungle fowl hunting activities. This result does not vary much with the results reported by Akrim et al. (2015) that hunting activity contribute 16.4% and the capture activity contributes 9.6% to the threats to the population of the red jungle fowl. Meanwhile, Liang et al. (2013) in his research on the hunting of various species of birds, including the red jungle fowl, reported that 43% of respondents do the hunting. In this study, the hunting locations were the plantation area and the transition area from forest land into cultivation land (blending zone). These results did not differ from that proposed by Javed and Rahmani (2000) that the red jungle fowls are more found in mixed forests. Meanwhile, Subhani et al. (2010) suggested that the habitat of the red jungle fowl is the woods and the scrub. In the study, it is also found that decoy chicken is not grounded, but it is perched on tree branches. This is in accordance with the opinion of Arshad and Zakaria (2009) who argued that the habit of red jungle fowl is perching on tree branches. The study also revealed that the red jungle fowl hunting community in Central Bengkulu District is carried out by using equipment such as nets, racit, or a combination of both. It's not much different from what was raised by Setianto, et al (2015a) who found that the same equipment was used to hunt the red jungle fowl in North Bengkulu. This result contrasted with the results found by Aiyadurai (2012) that the hunt is done by using traps (bamboo slats, canopies, stone, triangular traps), catapults, and rifles. Meanwhile, Liang et al. (2013) said that the hunting is done using a rifle, air guns, and traps. Differences in the way of hunting and the equipment are due to differences in study sites. The hunt for the red jungle fowls by the people in the study site resulted in the living red jungle fowls, so there's an opportunity for development and conservation efforts. However, the newly captured red jungle fowls are very wild. Therefore, many breeders are reluctant in nurturing these fowls. The wild nature of red jungle fowl is also found in its descendants, although it has been properly taken care of since hatching (Brisbin and Peterson 2007).

From the research, it can be concluded that the chicks of red jungle fowl are made available by people in Central Bengkulu District by deriving it from nature through the hunting in the forests or in plantations area, as well as from surrounding communities either by way of buying or conferral. The equipment used for hunting in the form of nets, racit, or a combination of both.

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