

Naga people's (Tasikmalaya District, West Java, Indonesia) local knowledge of the variations and traditional management farm of village chickens

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Abstract. Partasasmita R, Iskandar J, Rukmana. 2017. Naga people's (Tasikmalaya District West Java, Indonesia) local knowledge of the variations and traditional management farm of village chickens. *Biodiversitas* 18: 834-843. There is a strong maintain on the traditional Sundanese traditions among the village people West Java in the modern agricultural and the livestock farming. For example, they have not adopted modern of race chickens with high external inputs, including chicken breeders, chicken foods, vitamins, antibiotics, and various modern medicines. Ordinarily, the consequence of this in a situation the village people have traditionally farmed the various village chickens based on local knowledge and strongly embed by culture. Recently, however, the traditional farming of the village chickens in many villages of West Java, has dramatically affected by rapid development of the introduction of commercial the modern race-chickens farming. As a result, the diversity of village chickens has dramatically decreased. In addition, the production system of the village chicken farm has extremely depended on external inputs. This paper discusses on local knowledge of Naga people of Tasikmalaya, West Java on variations and cultural practice among the Naga people in the managing of the village chicken farm. The method used in this study was mixed of qualitative and quantitative with the ethnozoological and ethnobiological approach. The result of the study shows that Naga people of Tasikmalaya, West Java has well-recognized variations of the village chickens which is based on the folk classification at the level specific and varietal. Until recently, the Naga people have traditionally managed the village chickens in the sustainable system due to economically viable, ecologically appropriate, and adaptable to socio-cultural traditions.

Keywords: Ethnozoological, local knowledge, Naga community, village chicken, West Java

INTRODUCTION

Indonesia has a rich diversity of local chicken because Indonesia has been recognized as one of the domestication centers of chicken in the world, in addition to Tiongkok and India (Sulandari 2007). On the basis of morphological characteristics, the local chicken or non-race chicken (*ayam bukan ras/buras*) of Indonesia has been revealed 31 local variations. They can be divided into two groups, namely specific chicken that has special characteristics, such as *ayam Cemani*, *ayam Kedu*, and *ayam Merawang*; and non-specific chicken or 'village chicken' (*ayam kampung*) that has wide distribution in many areas of Indonesia (Sulandari et al. 2007; Sastrapradja 2010). Traditionally, various 'village chicken' (*ayam kampung*) have been predominantly farmed for a long time by the village communities of West Java. For example, based on the village ecological research conducted from 351 household respondents of 16 villages in the Citarum Watershed, West Java in 1970s, revealed the village chicken was one of the dominant livestock that are farmed by respondents (Karyono et al. 1977). Initially, various village chickens have predominantly farmed based on traditional ecological knowledge with deeply embedded with traditional culture (cf. Toledo 2002). Therefore, various inputs, such as chicken breeder, chicken food, vitamins and chicken medicines for production of chicken farming system have

predominantly obtained from internal (village) instead of buying from urban or overseas. In other words, in general, the low external inputs and sustainable agriculture (LEISA) and organic farming have been mainly applied by the village people to farm various village chickens (cf. Reijntjes et al. 1992).

Traditionally, by the management of the village chickens, some ecological and socio-economic and cultural benefits, such as dung manure, meat, and egg of chicken to fulfill the household needs have obtained by village people (cf. Soemarwoto and Soemarwoto 1984; Sidadolog 2007). Recently, however, the traditional farming systems of village chickens in many villages of West Java, has dramatically affected by rapid development of introduction of the commercial race-chickens farming. It has been supported by the high capital and various external inputs, such as day of chicken (DOC), artificial food, vitamins, antibiotics, and factory medicines. Interestingly, many people in a number of industrialized countries regularly use some form of traditional complementary or alternative medicine (TCAM) for treating livestock/pets, such as Germany (75%), Canada (70%), England (47%) and Ethiopia (90%) (Kayne 2010; Thomas et al. 2001; Yiguze et al. 2014). As a result, since 1970s many village people have adopted the commercial race-chickens and homogenously farming race-chickens. Indeed, the diversity of various village chickens has rapidly decreased. Consequently, the

diversity potential of various village chickens for breeding programs to produce superior chickens, such as health meat, pest resistant, and adapted to local ecological and socio-economic conditions would be lost. Indeed, various traditional ecological knowledge of village people on ecological and biological have disappeared.

This paper discusses on local knowledge of Naga community of Tasikmalaya, West Java on variations and cultural practice among the Naga community in the managing of village chicken farm.

MATERIALS AND METHODS

Study area

This research was undertaken in the hamlet (*kampung*) of Naga, village (*desa*) of Neglasari, sub-district (*kecamatan*) of Salawu, district (*kabupaten*) of Tasikmalaya, provinsi (*province*) of West Java (Figure 1). The Naga is a hamlet situated in the valley of edge main road to connect Garut and Tasikmalaya. The hamlet location has a distance approximately 26 km and 30 km from Garut and Tasikmalaya, respectively. To reach the Naga hamlet from the main road, we must walk traverse a hundred steers of footpath and Ciwulan dike of the river approximately less than one km. The Naga hamlet has a total area of 1.5 ha. Traditionally, the area can be divided by the local community into three main zoning, namely 'holy area' or 'sacred place' (*kawasan suci*), 'clean area' (*kawasan bersih*) and 'dirty area' (*kawasan kotor*) (Suganda 2006; Iskandar 2009). The first zoning, the holy area, consists of mature forest that is considered as a sacred place. Because bases on the Naga perception, their ancestors have been buried in this forest and must be respected. This forest area is traditionally prohibited from conversing for agriculture activities. Indeed, the trees of the forests are prohibited to cut. As a result, various flora and fauna have been properly

maintained over time. The second zonation, clean area as the people settlement comprises houses (*imah*), mosque (*mesjid*), meeting house (*bale patemon*), special house to store of heirlooms (*benda pusaka*) and rice barn (*leuit*). The houses are built close together. The front, back and sides of the house are called *buruan*, *jarian* or *buri*, and *pipir*, respectively. The *buruan* can never be planted with crops and is mainly used by playing children or for drying rice and other crops. The Naga houses are constructed from wood, bamboo, and aren leaf, and aren palm fibre. The houses are typically built on stilts over a base of stone, are timber-framed with the floor about 50 cm from the house. The space under the house is generally kept free through may be used for firewood or chicken house. This area is kept to solid wastes, such as dung of buffalo and ships. Meanwhile, the third zoning, the dirty area, is located on the edge of settlement consist of the sheepfold, fishpond, and bathroom above the fish pond. The fish pond has an important role in harvesting rain, to rare fishes, to crops various vegetables in fishpond dike (Iskandar 2009). In addition, the rice field, garden, and perennial mixed garden are placed outside of the settlement area.

The Naga people have been recognized as one of the traditional communities in West Java with a total population recorded people 298 individual, representing 100 households in 2015. Some traditions including constructing a house and using electricity have been prohibited by the Naga culture. The main subsistence of the people revealed as farmers and bamboo craftsmen. Some livestock, such as village chicken, sheep, and goat have traditionally farmed by people. In addition, various species of fish, such as common carp/ikan mas (*Cyprinus carpio*), tilapia/mujaer (*Tilapia mossambica*), nila (*Tilapia nilotica*), tawes (*Puntius javanicus*), tambakan (*Helostoma temminci*), gurami (*Osphronemus gourami*), and catfish/lele (*Clarias batrachus*) have been traditionally reared in the fishpond.



Figure 1. Study area of Naga Hamlet, Neglasari Village, Salawu Subdistrict, Tasikmalaya District, West Java, Indonesia

Procedure

The method used in this study was mixed of qualitative and quantitative with the ethnozoological and ethnobiological approach (cf. Newing et al. 2011; Iskandar 2012; Albuquerque et al. 2014). It means, this study approach is most emphasized on human perceive, classify, names, and use of biology or zoology, particularly chickens (cf. Carlson and Maffi 2004; Ellen 2006). For collecting the qualitative data, field observation and deep interview with informants were applied. Some field observations on environmental conditions, such as settlement, agricultural, and forest, and people activities in management village chicken were undertaken. In addition, deep interview with competent informants, such as informal leaders, village administration leaders (RT, RW), old male and female farmers was carried out. Meanwhile, for collecting the quantitative data, the semi-structure interview with respondent using questionnaire was applied. To decide the respondent number, statistical formula of Lynch et al. (1974) used as presented below:

$$n = \frac{N \cdot Z^2 \cdot P \cdot (1-P)}{N \cdot d^2 + Z^2 \cdot (1-P)}$$

Where,

n = sample number, 33 households (respondents)

N = total household population of Naga hamlets (100 households)

Z = normal variable value (1.96)

P = largest possible proportion (0.50)

On the basis of statistic calculation, 33 households of respondent were randomly selected and interviewed using questionnaire sheets that have been prepared in advance.

Data analysis

The qualitative data collected by the field observation and deep interview with informants were analyzed by cross-checking, summarizing and synthesizing, and narrated with descriptive analysis. Meanwhile, the quantitative data obtained from questioner with respondents were calculated by simple statistic, mainly presents of respondent answering of the question are and then narrated with descriptive analysis (cf. Newing et al. 2014).

RESULTS AND DISCUSSION

Local knowledge of village chicken variation

The Naga term for the chickens generally is *hayam* or *ayam* in Indonesian. On the basis of folk classification as mentioned by Berlin et al (1973) and Berlin (1992), the Naga people recognize four taxonomic levels, namely the level of live-form *ungags*, followed by generic, specific and varietal, as *hayam*, *hayam kampung*, and various *hayam kampung*, respectively (Table1).

As it can be seen from the Table 1, the Naga people well recognize the chicken classification particularly at the level three and four which is analog with species/specific and varietal in term of biological scientific classification. The folk classification of Naga people is similar to Karam (Bulmer 1967), Katengan (Diamond and Bishop 2000), Wola, Papua New Guinea (Sillitoe 2003), and Karangwangi (Iskandar et al. 2015) in that it has well recognized the chicken classification particularly at the level species/specific and varietal.

Table 1. Folk classification*) of Naga people, Tasikmalaya, West Java, Indonesia on various chickens

Level	Rank	Sundanese	Indonesian	English equivalent
0	Unique beginner	<i>Sato</i>	<i>Bintang/Satwa</i>	Animal
1	Life form	<i>Unggas</i>	<i>Unggas</i>	Domestic fowl
2	Generic	<i>Hayam</i>	<i>Ayam</i>	Chicken
3	Specific	<i>Hayam kampung</i>	<i>Ayam kampung</i>	Village chicken, Non-race chicken
4	Varietal	<i>Hayam (kampung) rengge</i>		Yellow, red and black feather chicken
		<i>Hayam (kampung) borontok</i>		Black and white feather chicken
		<i>Hayam (kampung) hideung</i>	<i>Ayam hitam</i>	Black color feather chicken
		<i>Hayam (kampung) bodas</i>	<i>Ayam putih</i>	White color feather chicken
		<i>Hayam (kampung) beureum</i>		Red color feather chicken
		<i>Hayam (kampung) hideung bangbara</i>		Blackish color feather chicken or similar to that of black beetle (<i>bangabara</i>) color
		<i>Hayam (kampung) bulu jalak</i>		Blackish color white patch chicken feather or similar to that of Asian Pied Starling (<i>manuk jalak</i>)
		<i>Hayam (kampung) rengge</i>		Curly feather chicken
		<i>Hayam (kampung) kate</i>		Small size chicken
		<i>Hayam (kampung) adu</i>		Cockfight chicken
		<i>Hayam (kampung) lisung</i>		Non-cock fight chicken

Note: *) Adapted from Berlin et al. (1973); Berlin (1992)

Traditionally, according to informants of the Naga people, chickens can be classified by Naga people into 5 variations, namely domestication, distinctive color, body size, a crowing cock, and croug to fight.

Domestication

On the basis of the Naga perception, in terms of the domestication of chicken can be divided into two categories, namely *hayam leuweung* (forest chicken or wild chicken) and *hayam piaraan* (domesticated chicken). The *hayam leuweung* (wild chicken or fowl) are traditionally recognized two kinds, namely *cangehgar* (green fowl) and *kasintu* (red fowl). Like the Naga perception, Western scientifically it has been known two species of wild fowl in Indonesia, namely green fowl or *Gallus gallus varius* (*Gallus varius*) and red fowl or *Gallus gallus bankiva* (*Gallus bankiva*). The *Gallus varius* has naturally distributed in Java, Lombok, Bali, Lombok, Sumbawa, and Flores (cf. King and Dickinson 1975; Sulandari et al. 2007). Meanwhile, the *Gallus bankiva* has distribution in Java, Sumatera, and Bali (Sulandari et al. 2007). The latter category, the *hayam piaraan* has been recognized as a result of domestication with a scientific name as *Gallus domesticus*. According to the Naga people, *hayam piaraan* can be divided into categories, namely *hayam kampung* (village chicken) or *hayam bukan ras/buras* (non-race chicken) and *hayam nagri* or *hayam ras* (race chicken). In terms of biological classification, both the wild and domesticated chickens are categorized as the kingdom of Animalia, class of Aves, order of Galliformes, a family of Phasianidae, and genus of *Gallus*.

On the basis of ecological history, the wild chicken was domesticated in Asia 8,000 years ago that have been originally domesticated in the round of Yellow river of China and the Indus valley of India. As a result, both areas have been recognized as a center of chicken domestication in the world. Moreover, the domesticated chickens have been distributed around the world. On the basis of morphological characteristics, it has been revealed 31 kinds of local chickens in Indonesia. The local chickens or non-race chickens (*ayam bukan ras* or *buras*) can be divided into two main groups, namely local specific chickens that have special characteristics, such as *ayam Cemani*, *ayam Kedu*, *ayam Merawang*, *ayam Nunukan*, *ayam Kedu Putih*, etc; and non-local specific or popularly known as 'village chicken' (*ayam kampung*) (Naatmijaya 2000; Sastrapradja 2010).

Distinctive color and feather forms

According to informants of Naga people, the village chickens can be divided to among other things by distinctive feather colors, namely *hayam (kampung) rengge* (yellow, red and black (village) color feather chicken), *hayam (kampung) borontok* (mixing black and white (village) color feather chicken), *hayam (kampung) hideung* (black (village) color feather chicken), *hayam (kampung) bodas* (white (village) color feather chicken), *hayam*

(*kampung*) *beureum* (red (village) color feather chicken), *hayam (kampung) hideung bangbara* (Blackish color feather chicken or similar to that of black beetle (*bangabara*) color), and *hayam (kampung) bulu jalak* (Blackish color white patch chicken feather or similar to that of Asian Pied Starling (*manuk jalak*)). In addition, based on informants the village chicken can traditionally divided into curly feather chicken or popularly known by village community as *hayam rintit* (curly feather chicken) and normal feather chicken form (*hayam bentuk bulu normal*). Like Naga people, the Karangwangi people have also traditionally classified birds based on distinctive color, such *heulang hideung* or black eagle (*Ictinaetus malayensis*) and *heulang coklat* or brown eagle (*Splornis cheela*) (Iskandar et al. 2016).

Body size

The village chicken can be traditionally divided by the Naga people into body size of village chicken. On the basis of body size, the village chicken can be divided into normal body size and small size body chicken or popularly known by both the Naga people and Sundanese people in general as *hayam kate* (small size chicken). In other words, *hayam kate* has small size body and short body.

Crocking cock

On the basis of crocking cock, the rooster can be divided into two categories namely *ayam jago* which has a good crocking, such as long crocking sound and good melodies, and non-good crocking sound. The rooster that has a good crocking has been known as *ayam pelung* that is originally come from Cianjur and spread to many parts of West Java. Meanwhile, the *non-ayam pelung* are recognized as an ordinary rooster. On the basis of ecological history, *ayam pelung* was firstly recorded in the village of Bumi Kasih, Jambu Dipa, Songgom and Tegal Lega, sub-district of Warung Kondang, district of Cianjur, West Java in 1850. The chicken then has been widely farmed in the district of Cianjur and Sukabumi, West Java (Sulandari et al. 2007a).

Croug to fight

Traditionally, on the basis of the Naga people perception, the rooster can also divide into two categories based on bold and brave in fighting. The bold rooster has been commonly given the name as *hayam lisung* (mortal rooster), and it cannot be involved in cock fighting. Meanwhile, the brave fighting rooster has been popularly recognized as *hayam jagoan* (the brave fighting rooster). More recently, the brave fighting has also given the name as *hayam Bangkok* due to the rooster that has predominantly imported from Bangkok, Thailand owns various advantages, such as big size body and bright in cock fighting. Today, the Bangkok chicken (*hayam Bangkok*) has been commonly farmed by chicken hobbyists in particular due to has a high price.

Cultural practices in the managing of village chicken

Source of the village chicken breeders and the traditional farming practice

On the basis of an interview with respondents, it has been revealed the *hayam kampung* (the village chickens) or *haram bursa/buskin raps* (non-race chickens) have been predominantly farmed by the Naga people. Traditionally, they have originally obtained the chicken breeders from different sources, such as buying from the neighbor (43%), give from the relatives (24%), and give the parents (21%) (Table 2). Based on this data, it can be seen that unlike the modern chicken farming, the Naga people have obtained chicken breeders from internal instead of externals, such as urban or exported from overseas. Indeed, the village chickens have been embedded by local culture. For example, as the traditional Sundanese of West Java and Banten, including the Baduy community of Kanekes village, South Baten to get upland rice seeds and chicken breeders has culturally obtained predominantly from giving parents. Particularly, the swidden rice (*pare Huma*) have been traditionally not allowed to sell. Therefore, each household of Baduy community to get the rice seeds of *pare huma* for annual cultivating the swidden by various social mechanisms, particularly by borrowing from the relative or neighbor (cf. Iskandar 1998).

The traditional farming practice

Managing the village chicken of the Naga people have traditionally conducted by each household. Initially, among individuals village chicken owned by the household, a couple of adult rooster and adult hens have bred (Figure 2).

According to informants, when the hen wants to spawn that is indicated by special behavior namely it seems to

tend to restless and tries to looking for a nest, the owner has prepared a chicken nest. Traditionally, the nest is made of *boboko/bakul* (bamboo cook rice basket) or *carangka/karanjang* (bamboo basket) and is filled by dry rice panicles. The nest is placed with affixing at the bamboo house wall. Moreover, the hen lays an egg each day with a total between 10-15 eggs. The total egg is categorized a normal because the local chicken is normally produced between 10 and 12 eggs/clutch for laying an egg of hen and will stop laying egg approximately and continuously recycle annual producing egg approximately three times (Iskandar 2007).

After the producing eggs, some of them are usually taken for the home consumption, particularly if the owner need it at that time, and the rests are hatched for approximately between 20 and 21 days. Moreover, the day old chickens (DOC) are taken from the nest and put in a separate cage. Due to the DOC is very vulnerable to die, and the chicks must be carefully looked after. For example, they are provided various foods, including residual of rice hulled of rice pounding in a wooden mortal (*huut* or *dedak*) and residual of rice hulled and small grain of hulled rice (*huut* and *beunyeur*) (Table 3).

Table 2. Source the village chicken breeders owned by the Naga community, Tasikmalaya, West Java, Indonesia

Source of the chicken breeders	Respondent number	Percent of the total
Buying from the neighbor	14	43%
Give from the relatives	8	24%
Give the parents	7	21%
Give from friends	4	12%
Total	33	100%

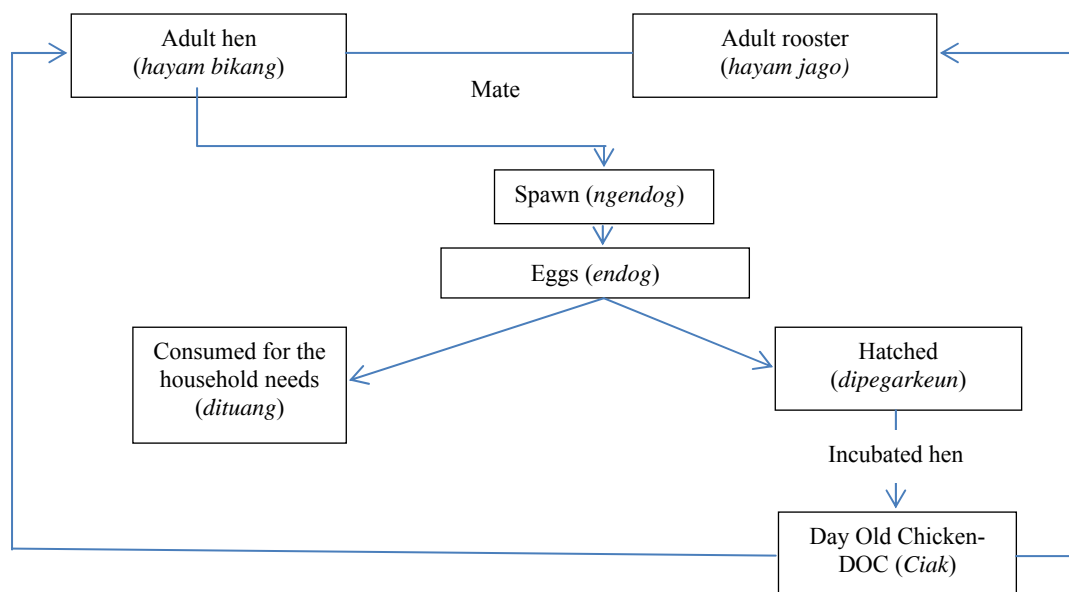


Figure 2. The traditional village chicken farming of the Naga community, Tasikmalaya, West Java, Indonesia

Table 3. Various chicken foodstuff have been traditionally used by Naga people, Tasikmalaya, West Java, Indonesia

Kind of foodstuff	Respondent number	Percent to total
Residual of rice hulled of rice pounding in a wooden mortal (<i>huut</i> or <i>dedak</i>)	22	67%
Residual of rice hulled and small grain of hulled rice (<i>huut</i> and <i>beunyeur</i>)	5	15%
Residual of rice hulled and unhulled rice (<i>Huut</i> and <i>pare gabah</i>)	3	9%
Residual of rice hulled and kitchen food rubbish (<i>huut</i> and <i>sisu makanan</i>)	2	6%
Residual of rice hulled, small grain of hulled rice, and unhulled rice (<i>huut</i> , <i>beunyeur</i> and <i>pare</i>)	1	3%
Total	33	100%

Traditionally, the foods are given twice or three times a day, in the morning and the afternoon. However, after one week both the chicks and their parent are released to try to find food themselves in the home gardens. They are freely released in the morning and are reentered to cage or chicken house at the afternoon. The chicken house of 5 m x 8 m is traditionally placed under the house on stilt. To maintain the cleanliness of the chicken house, the chicken dungs have been regularly cleaned by broomstick approximately three times weekly. Moreover, the chicken duck is collected to use as the organic fertilizer in various agroecosystems, such as the home garden and garden. Unlike the modern race chicken farming, it has been traditionally practiced that not all individual chickens are normally entered to chicken houses at night. Some individuals, however, have freely spent the night outside the chicken houses and perched on the branches of various trees at the home garden. This tradition has both some advantages and disadvantages. Some advantages such as the chickens that have usually spent the night outside chicken houses might be freely infected by diseases during an outbreak of infectious diseases. Meanwhile, some advantages, such as those individual chickens have right risk to be stolen by a thief or killed by predators, such as Asian palm civet (*careth/musang*, *Paradoxurus hermaphroditus*) (Partasasmita et al. 2016)

Regarding the development of age of chicks, based on informants of Naga people approximately six months of chick age have been considered as mature chicken. As a result, the pair rooster and hen adult of weighing between 1 and 1.5 kilograms have commonly mated. After mating, as mentioned earlier, the hen lays one egg each day with a total between 10-15 eggs. Normally, each hen produces eggs three times annually of the breeding. However, according to informants, if the owner wants to their hens breed quickly after hatching, the chicks must be separated as soon as possible. Therefore, if the hen has not raised her chicks, the hen will quickly rebreed and produce eggs.

The village chicken diseases

According to the structured interview with respondents of the Naga people, 76 percent of respondent revealed that their village chickens have affected by diseases, while the rest of respondents (24%) their chickens have never been affected by diseases. Indeed, unlike the modern race-chicken farming, the *flu burung* (the Avian Influenza-AI) that is caused by virus influenza type A of the Family *Orthomyxoviridae* has never been recorded to attack the village chicken farming of Naga people. It is caused the Naga people have not adopted the modern chicken farm systems, such as the introduction of DOC form urban or overseas. As a result, the village chicken has not high riskily infected by the AI disease. Indeed, the majority of the local chickens of Indonesia have resistant to AI disease (cf. Sulandari et al. 2007b; Sastrapradja 2010). Meanwhile, based on statically data it has been revealed until 2008, the AI broadly recorded in 1289 districts of 31 provinces, with 110 people positively infected and 89 died until 2008 (Sulandri et al. 2007, Withworth et al. 2008).

Unlike the modern race-chicken farming, the predominant village chicken disease of Naga has revealed *cekak* disease or *tetelo* disease. This disease has scientifically recognized as Newcastle Disease (ND). On the basis of ecological history, the Newcastle Disease (ND) was firstly found Newcastle city, the United Kingdom in 1926 and it has widely spread around the world, including Indonesia (Muslim 1993). This disease is caused by a virus of genera *Aulavirus* of family *Paramyxoviridae*. The Aulavirus is known as virus RNA with single-stranded and negative polarity (Kencana et al. 2012). The transmission of the virus of ND from one individual chicken to each other has directly and not directly contacted. The source of the virus is usually derived from feces or urine of individual infected chickens. Moreover, the chicken is infected through various media, such as chicken food, chicken drink, mucus, feces, air, and air. During the individual chicken has affected by the virus, this chicken produced virus through feces.

On the basis of the respondent experiences, the village chickens have been predominantly affected by diseases, such as *cekak* (the Newcastle Disease) particularly during the transition from the dry to wet season, and in versa. The *cekak* disease have distinctive empirically observed, namely lost appetite, continue to drink, white liquid out of the anus, look weak (*nguyung*), not excited, and bluish comb. Similarly, on the basis of scientific diagnostic, the Newcastle Disease has characteristically indicated, namely respiratory disturbance, open bill, caught, sneezing, breaths sound snoring, lack of appetite, continue to drink, green or yellow watery feces, and sometimes bloody (Zainnudin and Wibawan 2007). Unlike the modern chicken farming, the village chicken of Naga, Tasikmalaya that has been affected by the Newcastle Disease have traditionally treated by the medicinal plants, such as onion, garlic, and papaya instead of applying modern medicines (Table 3). On the basis of study ethno veterinary pharmacology, these crops have also been used to treat the ruminant livestock diseases of village people of Pasir Biru, Rancakalong, Sumedang, West Java (Mutaqin et al. 2015), livestock

diseases in Ethiopia (Yigezu et al. 2014), in Brazil (Souto et al. 2012; 2013; Confessor et al. 2009), South Africa (Luseba and Tshisikhaw 2013). In addition, a bulb of garlic has been traditionally used for the human health medicines, such as against a cough, asthma, hyperemesis, otitis internal, scabies, antidote for poison insect bite, hypotension, cholera, as anthelmintic, against migraine, dysmenorrhea, impotency. Banana fruit and its seeds have been used as against *catarrhus intestinalis*, hemorrhoids, and *aphthae tropicae*. Meanwhile, leaf of *Lantana camara* as cure against abscess, colica, nusea, as diaphoretic, against *jumetactio*, rheumatism, tussis (Kasahara and Hemmi 1986; cf. Confessor et al. 2009)

Utilization of the village chicken

According to respondents of the Naga people, Tasikmalaya, West Java, the village chicken farm has provided some socio-economic and cultural, and ecological benefits (Table 4).

In terms of socio-economic and cultural functions, the meat and egg have been traditionally produced to fulfill the protein food of the household. For example, the village chickens have annually slaughtered by owners for using some household rituals, *hajatan* or *salametan*, such as birth *hajatan* or well-being of baby (*nyalamekeun orok*), circumcision *hajatan* (*hajatan sunatan*), marriage *hajatan* (*hajatan ngawinkeun*) and dead *hajatan* (*hajatan kapapatenan*). The purpose of a *hajatan* or *salametan* namely the giving away of food to bring it in the condition of *salamet* (well-being) (cf. Wessing 1978; Martinez GJ. 2013; Vliet et al. 2014; 2015). In terms of the marriage tradition of the Naga people, after wedding ceremony the new bride must visit (*munjungan*) some families of the groom to carry various traditional foods and cakes, including village chicken. In return, they will be given the amount of money and food material from

the groom families. The village chickens have also been used for various Islamic feasts, including the ritual of the beginning the fasting month (*Muanggahan*), the ritual of the end of fasting month (*Lebaran Idulfitri*), *Muludan*, and *Rajaban*. In addition, the chicken and meats have been provided for various rituals in the agricultural activities, such as planting and harvesting rice. The main purpose of these rituals is an expression of gratitude to the god because each household of Naga have been given well-being (*salamet*) and good luck of the form of various agricultural productions. It has been widely practiced, particularly in the past, the Sundanese people in their daily life used to respect and to maintain the environment. For example, considering the importance of water, it should come as no surprise that the practice performed at the seedbed and at transplanting time were primarily concerned with assuring an adequate water supply. At the source of water and at the place where it enters the rice field, a ritual (*mitembayan*) used to performed (cf. Wessing 1978)

Table 4. The Utilization of village chickens has traditionally performed by the Naga people of Tasikmalaya, West Java, Indonesia

Utilization	Respondent number	Percent of the total
Source of meat and egg	27	82%
For sale to obtain cash income	20	61%
To produce organic fertilizer	33	100%
For purposes of the household rituals	24	42%
For giving to neighboring or relative who has household ritual	2	6%
Egg is used as the traditional medicines	5	15%

Table 3. Various plants, organ used, and how to use, and chemical content of medicinal plants have been traditionally used as medicines of village chicken of Naga people, Tasikmalaya, West Java, Indonesia

Medicinal plant	Organ use	How to use	Chemical content
<i>Bawang merah</i> <i>beureum/bawang merah</i> -onion (<i>Allium cepa</i> var <i>ascalonicum</i> L)	The bulb	One bulb of onion is excellently mashed and fed to sick chicken One bulb of mashed onion mixed with one spoon of vegetable oil drunk to sick chicken.	Volatile oils, sikloaliin, metialiin, dihidroalin, flavoglikosida, saponin, and peptide (Damayanti 2008)
<i>Bawang bodas</i> / <i>bawang putih</i> -garlic (<i>Allium sativum</i> L)	The bulb	One bulb of garlic is excellently mashed and fed to sick chicken.	Volatile oils, alisin, sterol, saponin, alkaloid, flavonoid and triterpenoid (Sunanti 2007)
<i>Cau lumut</i> / <i>pisang lumut</i> -banana (<i>Musa paradisiaca</i> var <i>sapientum</i> (L) Kuntze)	Fruit	One banana fruit is meshed and fed to sick chicken, or meshed mixed with chicken food feed to sick chicken.	Flavonoid, potassium, pectin, serotine, melatonin and dopamine. Banana fruit of against <i>catarrhus intestinalis</i> (Kasahara and Hemmi 2007).
<i>Gedang</i> / <i>papaya</i> -papaya (<i>Carica papaya</i> L)	Leaf	1-2 leafs of papaya are boiled and placed in a chicken food container to be eaten by sick chicken.	Papain, kimopapain, α -tokoferol, ascorbic acid, flavonoid, glucoside sianogenic, glucocinolate, and cystatin (Damayanti 2008)
<i>Leunca hayam</i> or saliar leaf (<i>Lantana camara</i> L)	leaf	3 leafs of Lantana are boiled and water extracted is placed in drink water container.	Lantaden A, Lantaden B, lantanolic acid, lantic acid, humulen, β -kariofilen, γ -terpiden, α -pinene and p-cymen (Permadi 2008)

Although various ritual traditions of village community as practiced the Naga people have been ignored and assumed as both hinder development and irrational by the modern or urban community, these rituals has been an important role for maintaining the social solidarity of the village community. For example, a shared pattern of beliefs can often provide a strong sense of group solidarity, including managing and maintaining natural resources and local environments. Therefore, it may be more useful to consider how these systems of ideas can be usefully incorporated into the process of development, rather than ignoring or attempting to replace (Lovelace 1984; Mustapa 1996).

In addition to meet, eggs of the village chicken have been an important role for the material of the traditional medicines, such as maintain body health. Traditionally, the upperpart of the egg is usually perforated. Moreover, the white part of the egg is removed from its shell. Meanwhile, the egg yolk whether is mixed with honey bees or directly swallowed as traditional medicine, that is believed to increase energy and to maintain body health.

The village chickens have been an important role not only in the subsistence economy but also for the commercial economy. Particularly, if the household of the Naga household needs to get cash, some individual village chickens have also been sold to relatives, neighbor or village middlemen. For example, the mature village chickens have been commonly sold to middlemen come from Garut and Tasikmalaya who regularly visit Naga hamlet of Neglasari village of Ciamis, approximately between Rp. 30,000 and Rp. 40,000 during the fasting month (*Ramadhan*) of 2015. According to informants, during the *Ramadhan*, the price of the village chickens has increased due to demand for the village chicken has increased. As a result, on the basis of an interview with respondent, it has been revealed during the *Ramadhan* in average approximately 30 individual village chicken have been sold by each household of Naga people. For each village chicken of between 1 kilogram and 1.5 kilograms has been sold Rp 35,000 in the *Ramadhan* time. The price of the village chicken, however, has decreased after the *Ramadhan* time, namely approximately between Rp. 18,000 and Rp. 20.000. Traditionally, although the Naga households have commonly traded the village chickens, some individual chickens have always been left to maintain population stock for sustainable management of the village chicken farming.

Of no less important to provide meat and egg, the village chicken farming has also provided chicken dung to use as organic fertilizer. According to structure interview with respondents of the Naga people, it has revealed all respondent has commonly used chicken dungs to fertilize various crops of the home gardens and gardens. For example, various crops including bawang merah (*Allium cepa* var. *ascalonicum* L), bawang putih (*Allium sativum* L), cengek/cabe rawit (*Capsicum frutescens* L), bawang daun (*Allium fistulosum* L), leunca (*Solanum nigrum* L), saledri (*Apium graveolens* L), and tomat (*Solanum lycopersicum* L) planted in garden have been

predominantly fertilized by organic fertilizers, including chicken dungs.

On the basis of agroecosystem analysis (cf. Conway and Barbier 1990), although the production of the village chicken farming of Naga, Tasikmalaya has been considered low compared to that of the modern race-chicken farming, the stability, equitability, and sustainability have been revealed high. For example, the village chicken farming has been resistant to diseases and fluctuations of the market economy due to low external inputs and maintaining a high diversity of local race village chicken. Moreover, almost all household has raised village chicken based on relatively similar inputs and outputs, therefore, the equitability of the village chicken farming considered as high. Indeed, due to low external inputs and resistant to diseases and fluctuates market economic conditions, as a result, the sustainability of the village chicken farming of Naga people can be considered as high.

In addition, the sustainability of the village chicken farming has been maintained by ecological knowledge and strongly embedded by cultural people, and adapted to local ecological conditions. For examples, to provide various village chicken foods have predominantly by local sources, such as residual of rice hulled (*huut*), small grain of hulled rice (*beunyeur*), and unhulled rice (*pare*). As a result, the modern of food, medicines, and vitamins have been rarely used or applied the LEISA (Low External Inputs and Sustainable Agriculture (Reijntjes et al. 1992). In addition, because the village chickens have predominantly freely looked for natural food in the home garden each day as very effective in the organic material cycle and produce chicken dungs to maintain soil fertility and to provide organic fertilizers for various crops in the village agroecosystems. Therefore, the village chickens have been considered an important role and integral parts of both the home garden and village ecosystems (Soemarwoto and Soemarwoto 1984; Soemarwoto 1985). In addition, production of the village chicken farming of meet and egg has provided the animal protein food that is essentially needed by the villagers. However, the traditional practice of the village chicken farming in many village areas of West Java has seriously affected by the introduction of the modern race-chicken farming since the 1970s. Unlike the village chicken farming, the modern race-chicken farming has high external inputs, such as DOC, food, vitamins and medicines from urban or overseas. Consequently, the modern race-chicken farming system has been vulnerable the market economic fluctuations and diseases. Indeed, the race-chickens have less resistant to diseases, such as the Avian Influenza (AI) compared to that the village chickens. As a result, the village chickens have a high potential as a source of the genetics of chickens that has resistant to AI (Sulandari et al. 2007; Sastrapradja 2010). Although the village chicken farming has been an important role for ecological and socio-economic and cultural village people and producing healthy meats and eggs due to avoiding the use of chemical medicine and antibiotic, many stoke holders have low attention to develop the village chicken farming. As a result, the village chicken farming has

seriously affected by the modern race-chicken farming. Indeed, some traditional ecological knowledge of the village people on ecological and biological chickens have eroded or even extinct.

Therefore, study on ethnozoology or the scientific evaluation of local knowledge of traditional on zoology, in this case on zoology of village chicken has been considered very important for development of sciences and practical results of the study can be used to support the development programs of Indonesia, such as sustainable management of biological sources (cf. Waren et al. 1995; Alves and Souto 2011; Souto et al. 2012; Alves and Souto 2015). In conclusion, this paper has demonstrated that the Naga community of Tasikmalaya, West Java has well-recognized variations of the village chickens which are based on the folk classification of Beelin et al. (1973) and Berlin (1992) at the level specific and varietal. In the management of the village chicken farm, the Naga community has been based on traditional ecological knowledge which is embedded with the culture and adapted to the local environmental conditions. Until recently, the Naga community has traditionally managed in the sustainable system due to economically viable, ecologically appropriate, and adaptable to socio-cultural traditions.

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