

The local knowledge of the rural people on species, role and hunting of birds: Case study in Karangwangi Village, West Java, Indonesia

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Abstract. Iskandar J, Iskandar BS, Partasasmita R. 2016. *The Local knowledge of the rural people on species, role, and hunting of birds: case study in Karangwangi village, Cidaun, West Java, Indonesia. Biodiversitas 17: 435-446.* Based on the ecological history, in the past many villages of in Indonesia including in West Java had a high diversity of birds. Nowadays, however, the diversity of birds in some villages of West Java has tended to decrease due to many factors, namely habitat loss, the use of pesticides, and intensive illegal bird hunting. The objective of this paper is to elucidate the local knowledge of Karangwangi village, West Java on species, role, and hunting of birds. Method used in this study is the qualitative and ethnoornithological approach with descriptive analysis. Results of study show that the Karangwangi people have a very good knowledge on bird species, particularly on level species/specific. Various bird species are traditionally classified into nine local categories (folk classification), namely based on distinctive voice/vocalization, morphological characteristic, special color, distinctive behavior, time activity, special common habitat, migrant, nest characteristics, and role in the ecosystem. Based on the rural people perception, the role of birds can be divided into two categories, namely notorious and beneficial birds. The diversity of rural birds has tended decrease over time due to various factors, including illegal bird hunting for various purposes of the village people, such as keep a bird in cages and bird trading. The study suggests the perception of rural people on birds have changed caused of socio-economic and cultural changes. Nowadays the bird hunting in the rural area has tended to shift from a purely subsistence form towards a more commercial form and, thus, to conserve bird species the study on ethnoornithology considered as a very important, and socio-economic and cultural rural people aspects might be integrated to national as well as international bird conservation programs.

Keywords: Bird classification, bird hunting, ethnoornithology, Karangwangi, local knowledge

INTRODUCTION

Indonesia recognized as one of the countries that has a high diversity of birds in the world after Brazil. It has been recorded 1.605 species of birds in Indonesia consists of 20 orders and 94 families, representing 16 percent of total bird species in the world (Bird Life International 2003; LIPI 2014). Indeed, Java island one of the major islands in Indonesia has also rich avifauna. According to Delacour (1947) 337 breeding species have been recorded in this island. While Hoogerwerf (1948) recorded 536 species and sub-species of birds in Java and the surrounding island, representing 410 species and sub-species of breeding, 111 species and sub-species of migrants, 13 species and sub-species stragglers, and 2 species and sub-species of unknown status. Various birds have an important role in ecological services or ecological functions, such as seed dispersal, pest predator, pollinator, and indicator of the environmental pollution and environmental changes (cf. Dammerman 1929; Dickinson et al. 1979; Howe and Westley 1988; Iskandar 2007; Iskandar 2015^a; Sodhi et al. 2011). In addition, the birds have socio-economic and cultural functions, such as for food, pet, pet trade, source of fables, tales, stories, folk songs, proverbs, symbolic, myths, and magic (cf. Iskandar 2007; Iskandar 2015a; Kizungu et

al. 1998; Jepson and Landle 2005; Alves 2009; van Vloeg and van Weerd 2010; Tidermann et al. 2011; Alves et al., 2013; Bezerra et al. 2013; Roldan Clara et al. 2014; Teixeira et al., 2014; Dandeniya et al. 2015; Partasasmita et. 2016).

Although various birds have an important role both in ecological and socio-economic functions, a lot of birds have been threatened in the village ecosystems of Indonesia, including in West Java in the last several decades. Consequently, some bird species have been recorded became rare or local extinct. Nowadays, it has been recorded some birds considered as globally (near) threatened in Java and Bali, such as Javan hawk eagle (*Spizaetus bartelsi*), grey-headed fish eagle (*Ichthyophaga ichthyaetus*), green peafowl (*Pavo muticus*), yellow-throated hanging-parrot (*Loriculus pusillus*), black-banded barbet (*Megalaema javensis*), white-breasted babbler (*Stachyris grammiceps*), white-bellied fantail (*Rhipidura euryura*) and straw-headed bulbul (*Pycnonotus zeylanicus*) (Van Balen 1999). Many factors have affected bird population in village ecosystems, such as habitat loss, the use of pesticides, and intensive illegal bird hunting (cf. van Balen 1999; Sodhi et al. 2011; Iskandar 2007; Iskandar 2015a; Iskandar and Iskandar 2015; Iskandar 2016). Therefore, the main factor that has caused affected bird

population in the village ecosystem namely human activities (cf. Alves et al. 2013; Iskandar 2015^a). Originally based on the ecological or environmental history, the village people had utilized birds based on local knowledge (corpus) and cosmos and beliefs (Toledo 2002). For example, most Sundanese villages of West Java had perceived some top predator birds, such as *serak* or barn owl (*Tyto alba*) and *loklok* (Family Strigiformes) as strongly related as mystic or magic (cf. Iskandar 2007; Partasasmita et al. 2016). In addition, traditionally if the village people had very frequently heard voice *uncuing* (cuckoos) and *gagak* (crows) that is considered as early warning there is a person might be pass away in their community member (cf. Iskandar 2007; Muiruri and Maundu 2011; Badriansyah et al. 2015). As a result, culturally those birds had been considered as scary birds and prohibited hunted. Indeed, those birds had rarely kept as pet and indirectly conserved by the village people. In addition, the forests that had culturally considered as sacred places and traditionally managed by the village people recorded owning a high diversity birds compared with that of in non-sacred places (cf. Iskandar 1998; Endri et al., 2015; Badriansyah et al. 2015).

Nowadays, however, some local knowledges as well as cosmoses of belief of village people in birds have eroded. The village birds have been intensively hunted not only for food and live bird keeping in the cages but also for both trading in local villages and trading in urban bird markets (cf. Jepson and Ladle 2005; Jepson 2011; Pangau adam et al. 2011; Iskandar 2015^b, Iskandar and Iskandar 2015). A lot of birds are currently hunted by the village people because various birds can be traded with high prices. Consequently, the populations of the village birds have dramatically decreased. In addition, intensive use of pesticides in the agriculture and habitat loss through land use conversion have seriously affected on the bird populations in the village area.

Because the village bird populations have tremendously decreased mainly caused of the human actions, therefore, to conserve the village bird populations, the socio-economic and cultural aspects must be considered. Indeed, the study on ethnoornithology—the study of bird in culture—useful to support the bird conservation. Due to the study on ornithology that is concerned in the complex of inter-relationship between birds, and all other living and non-living things (Tidemann et al. 2011).

Due to main source of the problems of threatened birds as well as the hope for solution is the human, we cannot talk about bird conservation without incorporating human dimensions (Alves 20012; Alves et al. 2013; Alves and Souto 2015). Ethnoornithology study of birds in cultures or an understanding of the place of birds in cultures, broadly study to the complex of inter-relationships between birds, humans and all other living and non-living things (Tidemann et al. 2010). Therefore, the result of the ethnoornithology studies can provide basic information for designing urgent conservation strategies, as well as promoting public policies (cf. Jepson 2011; Alves 2012; Alves et al. 2013; Bezera et al. 2013). Although the ethnoornithology is a very important, the ethnoornithology

has not yet become well integrated within avian conservation (Bonta 2011). Indeed, study on ethno-ornithology studies have rarely undertaken in Indonesia.

The objective of this paper is to elucidate the local knowledge of Karangwangi village, West Java on species, role, and hunting of birds.

MATERIALS AND METHODS

Materials

Some materials were used in this study, including the field guide books to the birds for bird identification, written by Delacour (1947), Hoogerwerf (1949a, 1949b), King et al. (1975); and Mac.Kinnon et al. (1992). In addition, some materials were used, namely binocular, GPS, camera, note book, and ballpoint.

Study area

Study was conducted in the Village (*desa*) of Karangwangi, Sub-district (*kecamatan*) of Cidaun, District (*kabupaten*) of Cianjur, Province (*provinsi*) of West Java, Indonesia. Geographically, the study area, village of Karangwangi lies between 7° 25'- 30'LS 7° and 107° 23'- 107° 25' E (Figure 1). The Karangwangi village is a remote area which has size of approximately 1,527.80 hectares that lies off the south of West Java. It has the distance approximately 120 km from the town of Bandung and approximately 70 km from the town of Cianjur, and to reach this area by vehicle needs a travel time of 5-6 hours from the town of Bandung and approximately 3-4 km from the town of Cianjur. Karangwangi village is directly bordered with Indian Ocean in the south and the nature conservation of Bojonglarang Jayanti in the west. Land used of the Karangawngi comprises the settlement and home garden, mixed garden, rice field, river, and the forest. In 2014, population of the Karangwangi was recorded 5,672 people consists of 2,864 males and 2,808 females, with total 1,691 households.

Procedure

Method was used in this study namely the qualitative with descriptive analysis which the ethno-ornithology or ethnobiology approach was applied (cf. Ellen 1993a; Ellen 1993b; Diamond and Bishop 1999; Newing et al. 2011; Iskandar 2012; Albuquerque et al. 2014). Some collecting field data techniques, such as observation, participant observation, and semi-structure or deep interview were applied. During the field research, the researcher stayed in the village between two and three weeks. For collecting ethnoornithology data, the researcher conducted deep interview with informants who was purposively selected by the snowball technique (cf. Newing et al., 2011; Albuquerque et al. 2014). Some informants were selected namely old people, the village formal and informal leaders, farmers, fishermen, bird hunters, and wild bird keepers in the village. Before conducting deep interview with informants, the nature and objective of the research were explained, and permission for the interviewees was requested to record information (cf. Alves et al. 2013). The interview

guideline contained namely the local name/vernacular name of birds, morphological characteristics, distinctive voice, special color, habitat types, and role in ecosystem and socio-cultural, and hunting of birds. To identify and validate bird species for interviewees, the researcher showed bird pictures which are presented in the books of field guide to the birds in Java, Western Indonesia, and Southeast Asia (Hoogerwerf 1949a; Hoogerwerf 1949b; King et al. 1975; MacKinnon et al. 1992). In addition, the participant observation was also conducted by researcher during the field research (Newing et al. 2011). For example, the researcher involved in bird hunting activities, namely went to the forests with the informants who were hunting birds.

In addition, to know existing birds and relative population of each bird species in the village study (Karangwangi village), special bird census was conducted by 'IPA' (*Indices Ponctuele d'Abondance*) or "PIA" (*Point Index of Abundance*) method (cf. Blondel et al. 1970; Iskandar 1980, van Helvoort 1981; Bibby et al. 1992). The IPA was undertaken by selecting special points at the different habitats, such as mixed-garden (*kebon tatangkalan*), coastal (*pantai*), and the forest area (*leuweung*) of the Nature Conservation of Bojonglarang, Karangwangi. In each point, researcher recorded all birds seen or heard in 15 minutes. Thus, total birds were collected in 46 point counts or IPAs, representing mixed-garden (6 counts), coastal (5 counts) and the forest of Nature conservation of Bojonglarang Jayanti (35 counts).

The various field data collected by observation and deep interviews were analyzed by cross-checking, summarizing and synthesizing, and to building up a narrative account (cf. Newing et al. 2011). While the data of bird population undertaken by the IPA-censuses were analyzed by calculating the index of dominance of each bird (Jorgensen 1976; Van Helvoort 1981) as follow:

$$D_i = N_i/N \times 100\% \text{ or } D_i = 100 \times p_i$$

Whereby:

D_i = dominance value of bird species i ;

N_i = number of individuals belonging to bird species i ;

N = total number of bird individual in the community (the sum of all N_i)

P_i = the proportion of the bird individuals of the i -th species of all bird individuals of the community

Moreover bird population can be divided into 3 categories: $D_i = 0$ -2% (non-dominant), $D_i=2$ -5% (sub-dominant), and $D_i=$ over 5% (dominant).

RESULTS AND DISCUSSION

Local knowledge on birds

The Karangwangi people term for birds generally is *manuk*. On the basis of folk classification as mentioned by Berlin (1992), the Karangwangi people recognize three taxonomic levels, namely the level of life form *manuk* (bird), followed by species, equivalent to Western biological classification, such as *cangkurileung* (Sooty-headed bulbul, *Pycnonotus aurigaster*), and divided into two sub-species or variations, culturally named *cangkurileung kapas* (*kapas* literally cotton or whitish meaning the whitish color of *cangkurileung*) and *cangkurileung kotok* (*kotok* literally chicken or dark, meaning dark color of *cangkurileung*) (Table 1).

As it can be seen from an example above that the Karangwangi people well recognize the bird classification particularly at the level two which is analog with species in term of biological scientific classification. The folk classification of Karangwangi people is similar to Karam (Bulmer 1967), Katengan (Diamond and Bishop 2000), and Wola, Papua New Guinea in that it has well recognized the bird classification particularly at the level two, species-specific.

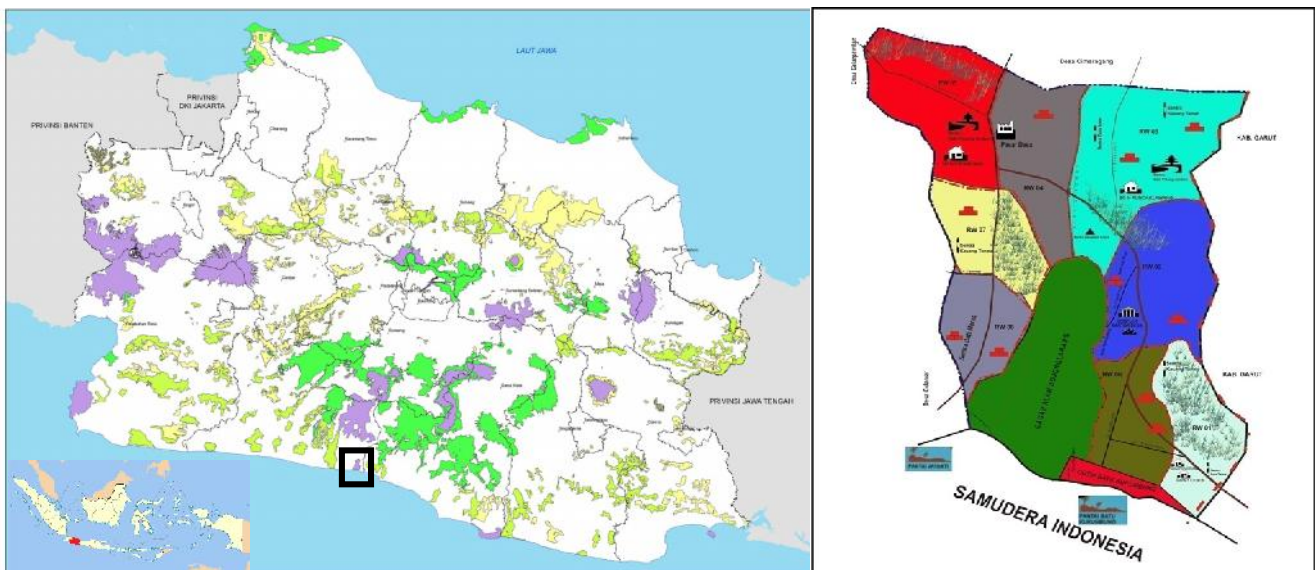


Figure 1. Research location, Karangwangi Village, Cidaun Sub-district, Cianjur District, West Java, Indonesia

On the basis of our interview with informants, it can be revealed that the Karangwangi people recognized at least 41 bird species. While based on the bird population study using IPA-censuses, it was recorded 40 bird species. These can be divided into 3 categorized, Dominant birds ($Di > 5\%$) recorded 5 species, *Halcyon chloris* ($Di=6,87\%$), *Lonchura leucogastroides* ($Di=26,87$), *Passer montanus* ($Di=7,32\%$), *Treroron curvirostra* ($Di=9,92\%$), and *Zosterops palpebrosus* ($Di=7,48\%$); sub-dominant birds ($Di=2-5\%$) recorded 8 bird species, *Collocalia esculenta* ($Di=2,13\%$), *Halcyon cyanoventris* ($Di=2,44\%$), *Megalema australis* ($Di=4,42\%$), *Nectarinia jugularis* ($2,44\%$); *Orthotomus ruficeps* ($Di=2,13\%$), *Orthotomus sepium* ($Di=4,58\%$), *Pycnonotus aurigaster* ($Di=4,88\%$) and *Treron griseicauda* ($Di=3,96\%$), and 27 bird species are categorized as non-dominant birds ($Di < 2\%$) (Table 2).

Totally bird species recorded both by the IPA-censuses and well recognized by informants of Karangwangi people were 51 bird species representing 14 species (24%) recognized as the protected animals based on Indonesian law (cf. Noerdjito et al. 2001). Of 19 bird species were recorded both by direct observation using IPA-censuses as well recognized by informants. Several bird species, such as *bueuk* (Collared scopsowl, *Otus bakkamoena/lempiji*), *koreak* (Barn owl, *Tyto alba*), and *cuhcur* (Large-tailed Nightjar, *Caprimulgus macrurus*) were well recognized by the informant but were not recorded by IPA-censuses. Due to these birds are recognized as nocturnal birds and were not recoded by the IPA-censuses recorded during the daytime. In addition, other bird species, such as *kerak kebo* (Javan myna, *Acridotheres javanicus*), *kangkareng* (Hornbill, *Anthraceros* sp.), *heulang hideung* (Black-eagle, *Ictinaetus malayensis*), and *paok* (Banded-pitta, *Pitta guajana*) were not recorded by the IPA-censuses because these bird populations have been very rare based on the Karangwangi people perception. Conversely, several bird species, such as *Abroscopus superciliaris*, *Acrocephalus orientalis*, and *Gerygone sulphurea*, were recorded by IPA-censuses but these birds were not well recognized by informants. Because these birds might be have small size and commonly lived in the remote forests, and have not culturally given attention by the Krangwangi people.

Folk classification and naming bird species

On the basis of the deep interview with informants of Karangwangi people, it has been revealed that 41 bird species are well recognized by the local people. These are classified on the basis of distinctive voice/vocalization,

morphological characteristic, special color, distinctive behavior, time activity, nest type, habitat, migrant, and role in the ecosystem (Table 3).

Distinctive voice

Bird voice or bird vocalization is the most significant aspects in naming birds in Karangwangi culture. Many bird species, for example, *Cipeuw* (*Aegithina tiphia*), *cuhcur* (*Caprimulgus macrurus*), *dudut* (*Centropus sinensis*), *gagak* (*Corvus enca*), *perkutut* (*Geopelia striata*), *kahkeh/kehkeh* (*Halcyon chloris*), *cekakak* (*Halcyon cyanoventris*), *toed* (*Lanius schach*), *piit* (*Lonchura leucogastroides*), *Ungkut-ungkut* (*Megalema haemacepahala*), and *Prenjak* (*Orthotomus ruficeps*) are culturally given vernacular name based on specific vocalization. Similarly, other bird species, such as *bueuk* (*Ottus bakamoena/lempiji*), *paok* (*Pitta guajana*), *Cininin/pacikrak* (*Prinia familiaris*), *ekek* (*Psittacula alexandri*), *cangkurileung* (*Pycnonotus aurigaster*), *jogjog* (*Pycnonotus goivier*), *tikukur* (*Streptopelia chinensis*), and *koreak* (*Tyto alba*) are attributed by characteristic vocalization (Table 3).

Like Sundanese people of Karangwangi, the Malay people of Malaysia have also recognized some vernacular names of bird species based on characteristic vocalization. For example, *uwak-uwak* (*Amaurornis poenicurus*), *cerewit* (*Lobivanellus indicus*), *tekukur* (*Streptopelia chinensis*), *but-but* or *bubut* (*Centropus sinensis*), *berek-berek* (*Merops viridis*), and *tiong* (*Gracula religiosa*) are culturally given vernacular name based on vocalization characteristic (Madoc 1976). Similarly, local people of Veddah in Sri Lanka have recognized many distinctive bird species based characteristic vocalization (Dandeniya et al. 2015).

Morphological characteristic

Morphological characteristic of bird species has been significantly considered to folk classify and given vernacular name by the Karangwangi people: *Dicrurus macrocercus* and *Zosterops palpebrosa* are case in point. The *Dicrurus macrocercus* (Black drongo) is attributed a vernacular name by the Karangwangi as *saeran gunting* because this bird has a characteristic that its tail has a scissor shap (*gunting*). Similarly, *Zosterops palpebrosus* (Oriental white-eye) is well recognized as *manuk kacamata* because this bird has diagnostic mark, based on the local people it has a very distinct the white eye ring which is similar to glasses sharp (*kacamata*).

Table 1. The three taxonomic levels of bird classification of Karangwangi people

Level	Class	English equivalent	Rank
0	<i>Sato</i>	Wild animal	Unique beginner
1	<i>Manuk</i>	Bird	Life-form
2	<i>Cangkurileung</i>	Sooty-headed bulbul	Species/specific
3	<i>Cangkurileung kapas</i>	White-sooty-headed bulbul	Sub-species
	<i>Cangkurileung kotok</i>	Bluish-sooty-headed bulbul	Sub-species

Table 2. Various bird species identified by the local people and recorded by the Point Count Index (PIA) in Karangwangi, Cidaun, West Java, Indonesia

Scientific name	Family	English name	Index of Abundance* (%)	Identified by local people**	Vernacular name
<i>Abroscopus superciliaris</i>	Sylviidae	Yellow-bellied warbler	0.15	-	-
<i>Acridotheres javanicus</i>	Sturnidae	Javan Myna	-	+	<i>Kerak kebo</i>
<i>Acrocephalus orientalis</i>	Sylviidae	Eastern Reed Warbler	0.45	-	-
<i>Acrocephalus stentoreus</i>	Sylviidae	Clamarous Reed-Warbler	0.30	-	-
<i>Aegithina tiphia</i>	Aegithinidae	Common-lora	0.30	+	<i>Cipeuw</i>
<i>Alcedo caurelescens</i> (p)	Alcedinidae	Small blue Kingfisher	0.45	-	-
<i>Alcedo meninting</i> (p)	Alcedinidae	Blue-eared Kingfisher	0.91	-	-
<i>Alcippe pyrrhoptera</i>	Timaliidae	Javan Fulvetta	0.91	-	-
<i>Anthracoceros</i> sp.	Bucerotidae	Hornbill	-	+	<i>Kangkareng</i>
<i>Antheptes malacensis</i> (p)	Nectariniidae	Plain-throated Sunbird	0.30	-	-
<i>Anthreptes singalensis</i> (p)	Nectariniidae	Ruby-cheeked Sunbird	0.30	-	-
<i>Cacomantis</i> sp.	Cuculidae	Cuckoo	-	+	<i>Uncuing</i>
<i>Caprimulgus macrurus</i>	Caprimulgidae	Large-tailed Nightjar	-	+	<i>Cuhcur</i>
<i>Centropus sinensis</i>	Cuculidae	Greater Coucal	0.30	+	<i>Dudut</i>
<i>Collocalia esculenta</i>	Apodidae	Glossy swiftlet	2.13	+	<i>Kapinis</i>
<i>Collocalia fuciphaga</i>	Apodidae	Edible-nest Swiftlet	-	+	<i>Kapinis guha</i>
<i>Copsychus saularis</i>	Turdidae	Magpie Robin	0.45	+	<i>Kacer</i>
<i>Corvus enca</i>	Corvidae	Slender-billed Crow	-	+	<i>Gagak</i>
<i>Dicaeum trigonostigma</i>	Diceidae	Orange-bellied Flowerpecker	0.30	-	-
<i>Dicaeum trochileum</i>	Diceidae	Scarlet-headed Flowerpecker	0.15	-	-
<i>Dicrurus macrocerceus</i>	Dicruridae	Black Drongo	-	+	<i>Saeran</i>
<i>Dicrurus paradisius</i>	Dicruridae	Greater Racket-tailed Drongo	-	+	<i>Saeran rame</i>
<i>Egretta sacra</i> (p)	Ardeidae	Pacific Reef-egret	0.91	+	<i>Kuntul</i>
<i>Gallus gallus bankiva</i>	Phasianidae	Red Junglefowl	0.91	+	<i>Cangehgar</i>
<i>Geopelia striata</i>	Columbidae	Zebra-Dove	-	+	<i>Perkutut</i>
<i>Gerygone sulphurea</i>	Sylviidae	Golden-bellied Gerygone	0.15	-	-
<i>Halcyon chloris</i> (p)	Alcedinidae	Collared Kingfisher	6.87	+	<i>Kahkeh/ kehkeh</i>
<i>Halcyon cyanoventris</i> (p)	Alcedinidae	Javan Kingfisher	2.44	+	<i>Cekakak</i>
<i>Haliaeetus leucogaster</i> (p)	Accipitridae	White-bellied Fish-Eagle	0.45	+	<i>Heulang bodas</i>
<i>Hirundo striola</i>	Hirundinidae	Striated Swallow	0.15	-	<i>Kapinis belang</i>
<i>Hirundo tahitica</i>	Hirundinidae	Pacific Swallow	0.15	-	<i>Kapinis bodas</i>
<i>Ictinaetus malayensis</i> (p)	Accipitridae	Black Eagle	-	+	<i>Heulang hideung</i>
<i>Lanius scach</i>	Laniidae	Long-tailed Shrike	-	+	<i>Toed</i>
<i>Lonchura leucogastroides</i>	Ploceidae	Javan Munia	26.87	+	<i>Piit</i>
<i>Macropygia emiliana</i>	Clumbidae	Ruddy Cuckoo-Dove	1.83	-	-
<i>Megalema armilaris</i> (p)	Capitonidae	Orange-fronted Barbet	0.15	-	-
<i>Megalema australis</i>	Capitonidae	Blue-eared Barbet	4.42	-	-
<i>Megalema haemacephala</i>	Capitonidae	Coppersmith Barbet	-	+	<i>Ungkut-ungkut</i>
<i>Nectarinia jugularis</i> (p)	Nectariniidae	Olive-backed Sunbird	2.44	-	-
<i>Orthotomus ruficeps</i>	Sylviidae	Ashy Tailorbird	2.13	+	<i>Prenjak</i>
<i>Orthotomus sepium</i>	Sylviidae	Olive-backed Tailorbird	4.58	+	<i>Prenjak</i>
<i>Orthotomus sutorius</i>	Sylviidae	Common Tailorbird	0.45	+	<i>Prenjak</i>
<i>Otus bakkamoena</i> (lempiji)	Strigiformes	Collared Scopsowl	-	+	<i>Bueuk</i>
<i>Passer montanus</i>	Ploceidae	Eurasian Tree Sparrow	7.32	+	<i>Galejra</i>
<i>Pitta guajana</i> (p)	Pittidae	Banded Pitta	-	+	<i>Paok</i>
<i>Ploceus</i> sp.	Ploceidae	Munia	-	+	<i>Manyar</i>
<i>Prinia familiaris</i>	Sylviidae	Bar-Winged Prinia	0.30	+	<i>Cininin/pacikrak</i>
<i>Psittacula alexandri</i>	Psittacidae	Red-Breasted Parakeet	-	+	<i>Ekek</i>
<i>Pycnonotus aurigaster</i>	Pycnonotidae	Sooty-headed Bulbul	4.88	+	<i>Cangkurileung</i>
<i>Pycnonotus goiavier</i>	Pycnonotidae	Yellow-vented Bulbul	1.37	+	<i>Jogjog</i>
<i>Spilornis cheela</i> (p)	Accipitridae	Crested Serpent Eagle	-	+	<i>Heulang coklat</i>
<i>Streptopelia bitorquata</i>	Columbidae	Island Collared-Dove	0.61	-	-
<i>Streptopelia chinensis</i>	Columbidae	Spotted-Dove	0.91	+	<i>Tikukur</i>
<i>Treron curvirostra</i>	Columbidae	Thick-billed Green-Pigeon	9.92	+	<i>Walik</i>
<i>Treron griseicauda</i>	Columbidae	Grey-cheeked Green Pigeon	3.96	+	<i>Walik</i>
<i>Tyto alba</i>	Strigiformes	Barn Owl	-	+	<i>Koreak</i>
<i>Zoothera citrina</i>	Turdidae	Orange-headed Thrush	-	+	<i>Anis</i>
<i>Zosterops chloris</i>	Zosteropidae	Lemon-bellied White-eye	0.61	+	<i>Manuk kacamata</i>
<i>Zosterops palpebrosus</i>	Zosteropidae	Oriental White-eye	7.48	+	<i>Manuk kacamata</i>

Note: *) – Not recorded by IPA censuses; (p) Protected birds based on Indonesian regulation (Regulation No.5, 1990, on the biodiversity and ecosystem conservation.

Like Karangwangi, the local people Malay of Malaysia have also culturally attributed various vernacular names of bird species based on distinctive morphological diagnostic: *burong botak* (Lesser adjutant, *Leptoptilos javanicus*) and *belatok kecil* (Sunda Woodpecker, *Dendrocopos moluccensis*) (Madoc 1976). In addition, the *Leptoptilos javanicus* is perceived by the local people of Malay has a diagnostic mark as a bald head bird (*burong kepala botak*) due to her head bald (*botak*). Similarly, the *Dendrocopos moluccensis* has been popularly called as *belatok kecil* because this bird has small size compared to other woodpecker bird family (Family Picidae).

Special color

Many birds have been culturally recognized by local people of Karangwangi with own specific vernacular name based on special color. For example, *Haliaeetus leucogaster* (White-bellied fish-eagle) has been culturally named as *heulang bodas* due to general color of feather is white (*bodas*), particularly the head and neck and underparts of the adult bird are white (*bodas*). Similarly, *Ictinaetus malayensis* (Black-eagle) and *Spilornis cheela* (Crested-serpent-eagle) are popularly recognised by Karangwangi as *heulang hideung* and *heulang coklat*, respectively because the *Ictinaetus malayensis* has all part black color (*hideung*) and *Spilornis cheela* has appearing to be brown (*coklat*), except in the tip of the tail has a broad white band. Like the Karangwang, the local people of Veddah in Sri Lanka (Dandeniya et al. 2015) and the Malay people of Malaysia (Madoc 1976), have also popularly recognized some birds which is given vernacular name based on special color. For example, *Munia maja* (White-headed munia) is famously named as *pipit uban* in the Malay people of Malaysia due to her head has color white or metaphoric as gray hair (*uban*). Another example, *Dinopium javanense* (Common golden back woodpecker) has been culturally called as *belatok mas* in the Malay, because this bird has diagnostic mark at the upper back and the wing-coverts are golden yellow similar golden color (*mas*).

Distinctive behavior

Some birds are culturally classified by local people of Karangwang based on characteristic behavior of those birds. *Manuk kerak kebo* (Javan Myna, *Acridotheres javanicus*), for example, has been given name by the local people because the behavior of this birds usually looking for food types of insects, particularly grasshopper near buffalo being herded in the rice field or grazing grassland. Similarly, this bird has been also commonly called by the Malay people of Malaysia as *gembala kerbau* (grazing buffalo) due to behavior of this bird usually looking for insects in grazing buffalo (cf. Madoc 1976). Another example, *Dicrurus paradiseus* (Greater racket-tailed drongo) has been culturally recognized by local people of Karangwangi as *saeran rame* (noisy drongo) because this bird has specific behavior which is perceived as 'noisy voice'.

Time activity

Local people of Karangwang's taxonomy have two distinct groups as 'diurnal bird species' or active birds at

the daytime (*manuk biasa liar siang*) and 'nocturnal bird species (*manuk liar peuting*). On the basis of the local people of Karangwangi most birds are considered as diurnal birds. However, some birds are culturally recognized as nocturnal birds, such as *cuhcur* (Large-tailed nightjar, *Caprimulgus macrurus*), *bueuk* (Collared scopsowl, *Otus bakkamoena/lempiji*), and *koreak* (Barn-owl, *Tyto alba*). Like all nightjar birds, the *cuhcur* starts working for insect at sunset. In the daytime it may be found hiding beneath trees and bushes in the mixed garden or secondary forest. Almost everyone of Karangwangi has been familiar with the vocalization of this bird as *cur-cur-cur*. *Bueuk* (Collared Scopsowl, *Otus bakkamoena/lempiji*) is a night bird. At the night time, this bird has frequently heard her voice instead of directly seen. The voice of *bueuk* has culturally herd as '*bueuk-boeuk-bueuk*'. Conversely, this bird usually takes rest in the mixed-garden or in the hole of wood tree. Similarly, *koreak* usually goes out from her resting places in the afternoon, such as house building and other buildings to find foods, namely rate. They usually fly from one place to other places which have distinctive voice as *koreak-koreak-koreak*.

Nesting type

The local people of Karangwangi village have categorized some birds based on nesting type and nesting characteristic. For example, *manuk manyar* (Streaked Weaver, *Ploceus manyar*) has been considered as the builders of wonderful nests. Conversely, *tikukur* (Spotted Dove, *Streptopelia chinensis*) considered as big bird size but it has been well known has bad and simple nesting type. Her nest is usually made of dried tree twig which relative small size. The local people of Karangwangi have also well recognised that *manuk uncuing* (cuckoo birds) is a real parasite, and its eggs have usually put in the nest of *manuk Prenjak* (Tailor-birds, *Orthotomus* sp.). While, *manuk kapinis gua* or *walet* (Edible-nest Swiftlet, *Collocalia fuciphaga*) recognised has distinctive nest in the cave and edible nest.

Like Karangangi the Veddah of Sri Lanka have culturally categorized birds, such as based on habits of birds and nesting behavior. For example, Streaked Weaver bird has been considered as interesting birds, such as this bird able to make unique nest (Dandeniya et al. 2015).

Habitat type

Some birds have traditionally categorized by the local people of Karangangi based on the habitat characteristic. On the basis of the interview with informants, it has been revealed that some birds have been categorized as village, icefield, forest, and coastal birds. For example, *manuk kangkareng* (Hornbill, *Anthracoceros* sp.), *cangehgar* (Red jungle fowl, *Gallus gallus bankiva*), *walik* (Green-pigeon, *Treron* sp.), and *merak* (Green Peafowl, *Pavo muticus*) are categorized as the forest birds. *Heulang bodas* (White-bellied fish-eagle, *Haliaeetus leucogaster*) and *kuntul* (Pacific Reef-egret, *Egreta sacra*) are culturally categorized as the coastal birds. *Manuk gereja* (Eurasian Tree Sparrow, *Passer montanus*), *Prenjak* (Ashy Tailor-bird, *Orthotomus ruficeps*), and *cangkurileung* (Sooty-

headed Bulbul, *Pycnonotus aurigaster*) are recognized as the village birds. While, *piit* (Javan Munia, *Lonchura leucogastroides*), *manyar* (Streaked-Weaver, *Ploceus manyar*), *peking* (Scaly-breasted Munia, *Lonchura punctulata*), and *bondol* (White-headed Munia, *Lonchura maja*) are categorized as the Richfield birds. In addition, *cekakak* (Javan Kingfisher, *Halcyon cyanoventris*) is categorized as the riverbank bird or close to water bodies.

Migrant

Some birds, such as *bondol* (White-headed Munia, *Lonchura maja*), *pipit* (Javan Munia, *Lonchura leucogastroides*), *peking* (Scaly-breasted Munia, *Lonchura punctulata*) and *ekek* (Red-breasted Parakeet, *Psittacula alexandri*), and *kuntul* (Javan Pond Heron, *Ardeola speciosa*) have been categorized by the local people of Karangwangi as local migrant birds. On the basis of the local people perception, *bondol*, *pipit*, *peking* and *ekek* have been predominantly found in the rice field (*sawah*) and the swidden field (*huma*), but after finishing rice harvesting they have locally migrated to other villages. Similarly, population of *manuk kuntul* has been predominantly found in the many wetlands during the rainy season but they usually move to other places and will return during the rainy season.

Role in the ecosystem

Some birds, such as *ekek* (Red-breasted Parakeet, *Psittacula alexandri*), *pipit* (Javan Munia, *Lonchura leucogastroides*), *peking* (Scaly-breasted Munia, *Lonchura punctulata*), *bondol* (White-headed Munia, *Lonchura maja*) and *manyar* (Streaked Weaver, *Ploceus manyar*) are cultural perceived as notorious birds. These birds are categorized as paddy seed eaters. Conversely, bird of *kapinis gua* or *walet* (Edible-nest Swiftlet, *Collocalia fuciphaga*) has been categorized as beneficial bird because the edible nest of this bird can be traded with a very high price. In addition, some raptor birds or top predators, such as *heulang coklat* (Crested Serpent-eagle, *Spilornis cheela*) and *koreak* (Barn owl, *Tyto alba*) have been categorized as beneficial birds due to rat eaters. Similarly, this bird has been considered as a beneficial bird in other Indonesian ethnics, such as village people of Petapahan, Riau, Sumatera (Badriansyah et al. 2015). In other words, based on the local people perception, the rats as paddy pest in the rice fields (*sawah*) and swidden farming fields (*huma*) might be controlled by raptors birds, namely *koreak* and *heulang ruyuk*.

The local people of Karangwangi culturally recognize also some birds, such as *kapinis* (*Hirundo* sp.) and special butterfly (*kukupu*) that are frequently observed in their village can be used as indicator of the beginning of the rainy season. Like, Karangwangi people, the local people the Dayak of Sarawak (Smythies 1960) the bird of wagtails, such as burung *beras-beras* (White wagtail, *Motacilla alba*) have been used as beginning of the rainy season or paddy season lot of paddy (*beras*) in the swidden fields. While, the *burung ketupong* (Rufous Piculet, *Sasia abnormis*) has been an important role for the Kantu Dayak in selecting the forest area that can be opened for the swidden farming system (*ladang*). For example, by

existing a lot of this bird in the certain forest area has been used as indicator such forest is not mature forest and not suitable for the planting paddy which might get a lot of terrestrial weeds (Dove 1988).

Role in sociocultural

Birds have closely associated with traditions of the local people of Karangwangi or Sundanese people in general. For example, birds have inspired for the local mythology, tale, song, and proverb. On the basis mythology, for example, *manuk lok-lok* (*lok-lok* bird of Family Strigiformes) has been considered as 'dreaded bird' because it has closely related with the Sundanese mythology, this bird become trans. Some birds also considered as bad omen, namely *uncuing* (Cockoo, *Cacomantis* sp.) and *gagak* (Crow, *Corvus* sp.) (cf. Iskandar 2007; Badriansyah et al. 2015). If people hear continually voice of these birds that is perceived as bad news, may be someone may pass away. Some tales in relation with birds have also been recognized by Sundanese rural people, tale of king of bird (*ratu manuk*) is case in point (cf. Iskandar 2007). Both songs and proverb of Sundanese in relation to birds are also culturally recognized in rural Sundanese of West Java, including the local people of Karangwangi, Cianjur, West Java.

Local knowledge on hunting birds

Traditionally hunting wild animals, including hunting birds have been recognized for a longtime in rural area across cultural in the world, including in West Java (cf. Iskandar, 1980; Iskandar 2014; Milton and Marhadi 1989; Alves 2012; Alves et al. 2013; Alves and Souto 2015). On the basis of semi-structure interview with informants of the local people of Karawang, Cianjur, West Java, the hunting birds had been commonly practiced by the Karangwangi people in the last time but now their hunting activities have tended to decrease due to bird population in their village have not abundant anymore.

Culturally, it has been recognized some techniques are predominantly practiced by local people of Karangwangi, namely to glue birds with sap (*ngaleugeut/ngelem*), to capture birds by nets (*ngajaring*), to catch birds with torch and kerosene lamp (*ngobor*), to hunt with a bamboo blowpipe (*susumpit*), and to hunt with a gun (*bebedil*) (Stachclyda 2015).

Ngaleugeut/ngelem-to glue birds with sap

This technique is aimed to catch live birds which are undertaken during the daytime. The main material commonly used for hunting bird by *ngaleugeut* technique is various sap, such as *karet* (*Hevea braziliensis* (Willd) Muell), *angka* (*Artocarpus heterophyllus* Lam), *teureup* (*Artocarpus elasticus* Reinw ex Blume) and *sirsak* (*Annona muricata* L). The sap is accommodated by container and simmering. The *ngaleugeut* technique is applied as following. Firstly, the stake bamboo or wood is prepared. Secondly, the bamboo or wood stake is covered by sap. Thirdly, the bamboo or wood stake that is covered by sap is put in the tree that is predominantly visited by birds. Another approach, the selected twigs of tree is covered

Table 3. Diagnostic characteristic used in Karangwangi, West Java, Indonesia bird classification

Folk classification	Vernacular name	Scientific name	English name	Description based on rural people perception (<i>emic view</i>)
Distinctive voice/ vocalization	<i>Cipeuw</i>	<i>Aegithina tiphia</i>	Common Iora	Voice: ciipeuw ciipeuw ciipeuw
	<i>Cuhcur</i>	<i>Caprimulgus macrurus</i>	Large-tailed Nightjar	Voice: cuur cuur cuur cuur
	<i>Dudut</i>	<i>Centropus sinensis</i>	Greater Coucal	Voice: duut duut duut duut
	<i>Gagak</i>	<i>Corvus enca</i>	Slender-billed Crow	Voice: gaaak gaaak gaaak
	<i>Perkutut</i>	<i>Geopelia striata</i>	Zebra-Dove	Voice: perkututut perkututut perkututut
	<i>Kahkeh/ kehkeh</i>	<i>Halcyon chloris</i>	Collared-Kingfisher	Voice: kahkeh kahkeh kahkeh or kekhkeh kehkeh kehkeh
	<i>Cekakak</i>	<i>Halcyon cyanoventris</i>	Javan Kingfisher	Voice: cekakakak cekakakak cekakakak
	<i>Toed</i>	<i>Lanius schach</i>	Long-tailed Shrike	Voice: toed toed toed toed
	<i>Piit</i>	<i>Lonchura leucogastroides</i>	Javan Munia	Voice: priet priet priet priet
	<i>Ungkut-ungkut</i>	<i>Megalema haemacephala</i>	Coppersmith Barbet	Voice: Ungkut-ungkut untkut or kut kut kut kut
	<i>Prenjak</i>	<i>Orthotomus ruficeps</i>	Ashy Tailorbird	Voice: prienjak prienjak prienjak
	<i>Bueuk</i>	<i>Otus bakkamoena/ lempiji</i>	Collared Scopsowl	Voice: bueuk bueuk bueuk
	<i>Paok</i>	<i>Pitta guajana</i>	Banded Pitta	Voice: paaok paaok paaok
	<i>Cininin/pacikrak</i>	<i>Prinia familiaris</i>	Bar-winged Prinia	Voice: cinininin cinininin cinininin or cikrak cikrak cikrak
	<i>Ekek</i>	<i>Psittacula alexandri</i>	Red-breasted Parakeet	Voice: keek keek keek keek
	<i>Cangkurileung</i>	<i>Pycnonotus aurigaster</i>	Sooty-headed Bulbul	Voice: dret dret kurileung, kurileung kurileung
	<i>Jogjog</i>	<i>Pycnonotus goiavier</i>	Yellow vented Bulbul	Voice: jog jog jog jog
	<i>Tikukur</i>	<i>Streptopelia chinensis</i>	Spotted-Dove	Voice: tiikukur tikukur tikukur or tikukur guk tikukur guk
<i>Kooreak</i>	<i>Tyto alba</i>	Barn Owl	Voice: kooreak kooreak kooreak	
<i>Loklok</i>	Family Strigiformes?		Voice: loklok loklok loklok	
Morphological characteristic	<i>Saeran gunting</i>	<i>Dicrurus macroceceus</i>	Black Drongo	The tail is deeply forked and similar to scissor shape (<i>gunting</i>)
	<i>Manuk kacamata</i>	<i>Zosterops palpebrosa</i>	Oriental White-eye	The white eye ring is similar to glasses shape (<i>kacamata</i>)
Special color	<i>Heulang bodas</i>	<i>Haliaeetus leucogaster</i>	White-bellied Fish-Eagle	General color of feather is white, particularly the head and neck and underparts of the adult bird are white (<i>bodas</i>).
	<i>Heulang hideung</i>	<i>Ictinaetus ma;ayensis</i>	Black-Eagle	The magnificent eagle which has appearing to be generally all black color (<i>hideung</i>)
	<i>Heulang coklat</i>	<i>Spilornis cheela</i>	Crested Serpent-eagle	Generally it has appearing to be brown (<i>coklat</i>), except in the tip of the tail has a broad white band.
Distinctive behavior	<i>Manuk kerak kebo</i>	<i>Acridotheres javanicus</i>	Javan Myna	This bird is frequently seen in rice field and grazing ground very close interaction with buffalo (<i>kebo</i>), particularly to find insects in the buffalo body or its surrounding.
	<i>Saeran rame</i>	<i>Dicrurus paradiseus</i>	Greater Racket-tailed Drongo	This bird has characteristic behavior, it has been considered as noise voice (<i>rame</i>)
	<i>Manuk saleser</i>	<i>Sitta azurea</i>	Blue-Nuthatch	This bird can be frequently seen running up the trunk of a tree or it seem to be creeping (<i>nyaleser</i>).

Time activity: diurnal and nocturnal	<i>Cuhcur</i>	<i>Caprimulgus macrurus</i>	Large-tailed Nightjar	Some birds, such as <i>cuhcur</i> , <i>bueuk</i> , and <i>koreak</i> are active in the night time (nocturnal) and in the day time it may be found hiding in the rest places. While other birds are considered as diurnal birds.
	<i>Bueuk</i> <i>Koreak</i>	<i>Otus bakkamoena/ lempiji</i> <i>Tyto alba</i>	Collared Scopsowl Barn Owl	
Special habitat	<i>Kangkareng</i> <i>Cangehgar</i>	<i>Anthracoceros albirostris</i> <i>Gallus gallus bankiva</i>	Oriental pied hornbill Junglefowl	These birds are perceived by local people as forest birds (<i>manuk leuweung</i>)
	<i>Walik</i> <i>Piit</i> <i>Manyar</i> <i>Kuntul</i> <i>Cangkurileung</i> <i>Prenjak</i> <i>Galejra</i>	<i>Treron spp.</i> <i>Lonchura leucogastroides</i> <i>Ploceus manyar</i> <i>Egretta intermedia</i> <i>Pycnonotus aurigaster</i> <i>Orthotomus ruficeps</i> <i>Passer montanus</i>	Green Pigeon Javan Munia Streaked Weaver Intermediate Egret Sooty-headed Bulbul Ashy Tailorbird Eurasian Tree Sparrow	These birds are perceived by local people as rice field birds (<i>manuk sawah</i>) These birds are perceived by local people as the coastal birds (<i>manuk pantai</i>) These birds are perceived by local people as rural birds (<i>manuk kamung/desa</i>)
Nest characteristic	<i>Manyar</i> <i>Tikukur</i> <i>Perkutut</i> <i>Caladi</i> <i>Cekakak</i>	<i>Ploceus manyar</i> <i>Streptopelia chinensis</i> <i>Geopelia striata</i> <i>Dendrocopos macei</i> <i>Halcyon chloris</i>	Streaked Weaver Spotted-Dove Zebra-Dove Fulvous-breasted woodpecker Collared-Kingfisher	The <i>manyar</i> nest is popularly recognized by local people as nice and unique nest. The nest, hung from the tip of branch or palm-frond, is flask-shaped. Conversely, the <i>tikukur</i> nest is considered by local people as a simple nest composed by dry branches <i>Caladi</i> is recognized by local people as has a nest in the tree hole. <i>Cekakak</i> is considered by local people as has nest in the hole of hill soil.
Migrant	<i>Ekek</i> <i>Pipit</i> <i>Peking</i> <i>Kuntul</i>	<i>Psittacula alexandri</i> <i>Lonchura leucogastroides</i> <i>Lonchura punctulata</i> <i>Egretta intermedia</i>	Red-breasted Parakeet Javan Munia Scaly-breasted Munia Intermediate Egret	Many birds, such as <i>ekek</i> , <i>pipit</i> , <i>peking</i> , and <i>kuntul</i> common locally migrate-out from village to other villages in off paddy farming season and migrate-in to the village during the paddy farming season. Similarly, <i>kuntul</i> local migrate-out from vill during dry season and migrate-in during the wet aor rainy season.
Role in ecosystem: ecosystem sevice and cultural functions	<i>Ekek</i> <i>Piit</i> <i>Peking</i> <i>Manyar</i> <i>Walet</i> <i>Cangehgar</i> <i>Heulang coklat</i> <i>Koreak</i>	<i>Psittacula alexandi</i> <i>Lonchura leucogastroides</i> <i>Lonchura punctulata</i> <i>Ploceus manyar.</i> <i>Collocalia fuciphaga</i> <i>Gallus gallus bankiva</i> <i>Spilornis cheea</i> <i>Tyto alba</i>	Red-breasted Parakeet Javan Munia Scaly-breasted Munia Streaked Weaver Edible-nest Swiftlet Junglefowl Crested Serpent-eagle Barn Owl	-Some birds, such as <i>ekek</i> , <i>piit</i> , <i>peking</i> , and <i>manyar</i> are perceived by local people as 'notorious birds' (<i>hama pare-eating paddy seeds</i>) Conversely, other bird species, such <i>walet</i> or <i>kapinis gua</i> which has edible nest, perceive as beneficial birds. Another bird species, such as <i>cangehgar</i> which has behavior to eat seeds, perceives as seed dispersal and considered as beneficial bird. Similarly, <i>heulang coklat</i> and <i>koreak</i> are perceived by local people as rat eaters and considered as beneficial bird. Cultural functions: birds in song, bird in mythos, bird in tale, and birds in bird keeping and trading.

with sap. Forth, the tame bird is put near the bamboo or stake wood or twigs covered by sap. In addition, the bird recording voice of handphone is active. Fifth, the bamboo or stake or twigs are awaited by the bird hunter. Some birds caught by sap are taken and released from the sap using the water or oil. Finally, the hunted birds are collected and put in the cage. In the past, most bird trapped was utilized for bird keeping in the household. Today, however, these bird trapped are traded to middlemen in the village or traded in the urban bird market.

Ngajaring —to capture birds with nets

Ngajaring technique is aimed to catch life birds by using nets. The nets is made by nylon with has along about 20 m. Procedures to catch birds by using nylon nets as follows. Firstly, the nylon nets are placed in areas where many birds, such as forest, river bank, and rice field. The secondly, the nylon nets are placed for a few hours and awaited by the bird hunters. Thirdly, the nylon nets placed are monitored and birds are trapped by nylon nets are released and put into the special cages. The forth, all bird trapped were utilized as source of protein food in the rural people and kept for bird keeping in the cages. Today, however, most bird trapped are sold to the rural middleman or directly brought to urban and selling in the urban bird markets (Figure 2).

On the basis of information from informants, various bird trapped can be sold in the rural have various price. Some common birds, such as *pipit* (*Lonchura leucogastroides*), *peking* (*Lonchura punctulata*), *kutilang* (*Pycnonotus aurigaster*), and *jogjog* (*Pycnonotus goiavier*) are commonly sold in the Krangwangi in a low price (*harga murah*) approximately between Rp. 20,000 and Rp 50,000. Another not-common bird, such as *saeran* (*Dicrurus macrocerceus*) can be sold with moderate price (*harga sedang*) about between Rp 150,000 and Rp 200,000. However, some popular bird songs that are popularly and frequently contested in urban areas, such as *anis* (*Zoothera citrina*) has commonly traded in the Karangwangi in a high price (*harga mahal*) between Rp 400,000 and Rp 500,000. However, this bird if is brought to urban and can be sold in more expensive approximately between Rp 700,000 and Rp 5,000,000. Indeed, the *anis* birds have been docile and good song, have very expensive price, about between Rp 12,000,000-Rp 50,000,000 (Iskandar 2015a).

Ngobor—to catch birds with torch and kerosene lamp

The *ngobor* technique is commonly undertaken by the local people of Karangwangi during the night. Some materials, such as kerosene lamp (*obor*), torch (*lampu senter*), gun (*senapan*), and bag (*kantung*) are commonly used for *ngobor*. The *ngobor* are usually conducted by four persons who each person has special duty, namely as carrying kerosene lamp, torch, gun, and bag, respectively. Culturally, procedure to catch birds with torch and kerosene as follows. Firstly, the appropriate place for hunting birds, particularly bird nesting place is decided. Secondly, the torch beam is directed to resting bird and shouted fire by gun. The dead bird shot by gun is taken by

one of the bird hunter members. The dead bird are collected and divided into 4 persons and brought to hamlet (*kampung*) for cooking as chief source protein in the urban area.

Susumpit —to hunt with a bamboo blowpipe

The *susumpit* technique is used several material, particularly a bamboo blowpipe (*sumpit*) and dart (*passer*). The bamboo blowpipe (*sumpit*) is made of a special bamboo called *awi tamiang* (*Schizostachyum iraten* Steud) the long segment of bamboo. The bamboo steak is cut and straightened by heating upper furnaces. To lengthen the bamboo blowpipe is normally spliced by another bamboo segment laced-up by rattan strip and glued to asphalt. The dart (*passer*) is made of bamboo stake that one of tip is sharpened and little bite burned, and in another tip is covered by kapok and tied by banana tree fiber yarn. A number of drat are commonly made because it will be lost in each blown.

The *susumpit* is usually undertaken during the daytime. The procedure of hunting birds with a bamboo blowpipe (*susumpit*) as follows. Firstly, perching bird is observed in different habitats, such as forest, mixed-garden, and river bank. Secondly, the perching bird is carefully approached with appropriate close distance. Thirdly, the targeted perching bird is blown by *sumpit* and dart goes toward the bird target. Forth, the bird in the dart puncture is collected and brought to the home. The birds obtained by *susumpit* are commonly utilized for meet cooking and consumed by the household members.

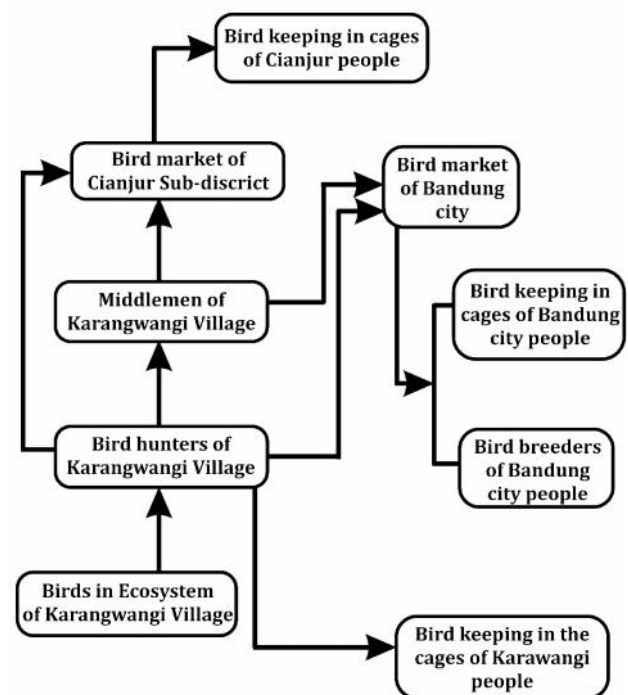


Figure 1. Trading chain of bird in Karangwangi village, West Java, Indonesia

Bebedil—to hunt with a gun

Both to hunt birds with a bamboo blowpipe (*susumpit*) and to hunt a gun (*bebedil*) have similar purpose namely to kill birds. However, unlike the *susumpit*, the gun (*bedil*) is mainly used by the bird hunter. Three types of guns are usually used by the local people of Karangwangi, namely *cuplis*, *senapan angin*, and *senapan modern*. The *cuplis* is traditionally made by the local people of Karangwangi, while the *senapan angin* and *senapan modern* made of urban industry. Procedure of hunting birds a gun (*bebedil*) is similar to that of the *susumpit* as follows. Firstly, perching bird is observed in different habitats, such as forest, mixed-garden, and river bank. Secondly, the perching bird is carefully approached with appropriate close distance. Thirdly, the targeted perching bird is shut by gun. Forth, the killed is collected and brought to the home. Like *susumpit*, the birds obtained by *bebedil* are commonly utilized for meet cooking and consumed by the household members.

The local knowledge of bird conservation

In the past, most Sundanese rural people of West Java utilized birds were based on the local knowledge and cosmos or belief (cf. Toledo 2002). For example, some birds such as *manuk caladi* (Family Picidae), *heulang* (Family Accipitridae) and alap-alap (Family Falconidae) were culturally prohibited (*pamali*) to kill and consume (cf. Iskandar 2014; Ekwochi et al. 2016). In addition, based on the local tradition, looking for some birds such *perkutut* (Zebra dove, *Geopelia striata*) would be provided 'lucky' (*keberuntungan*). Conversely, the looking for *gagak* and *uncuing* was perceived would bad consequences of bad luck or unfortunate. As a result, some birds of raptors, woodpeckers, *gagak* and *uncuing*, have been culturally protected by the Sundanese local people of West Java (Iskandar 2014). Today, however, some culturally prohibitions or taboos (*pamali*) have been eroded due to rapid socio-economic and cultural changes. For example, based of deep interview with informants, almost all bird species including the protected birds by the government are allowed to capture, kill, and to trade by the rural people. As a result, the populations of some birds in the rural area have rapidly decreased due to over exploitation. Indeed, based on the informant perception, some birds, such as *kangkareng* (Hornbill, *Anthracoeros* sp.), *cuhcur* (Large-tailed Nightjar, *Caprimulgus macrurus*), *gagak*, *gelatik* (Great tit, *Parus major*), *merak* (Green-Peafowl, *Pavo muticus*), *paok* (Banded-Pitta, *Pitta guajana*), *ekek* (Red-breasted Parakeet, *Psittacula alexandri*), *kerak kebo* (Javan Myna, *Acridotheres javanicus*), *anis* (Orange-headed-Trush, *Zoothera citrina*), and *ciung* (Whisting-thrush, *Myiophoneus* sp.) have been considered as very rare or already local extinct.

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