Hobby and business on trading birds: Case study in bird market of Sukahaji, Bandung, West Java and Splendid, Malang, East Java (Indonesia)

BUDIAWATI S. ISKANDAR¹, JOHAN ISKANDAR², RUHYAT PARTASASMITA^{2,*}

¹ Department of Anthropology, Faculty of Social and Political Science, Universitas Padjadjaran. Jl. Raya Bandung-Sumedang Km 21, Kampus Jatinangor, Sumedang 45363, West Java, Indonesia

² Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Jl. Raya Bandung-Sumedang Km 21, Kampus Jatinangor, Sumedang 45363, West Java, Indonesia. Tel +62-22-7797712, *email: rp2010rikkyo@gmail.com; ruhyat.partasasmita@unpad.ac.id

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Abstract. Iskandar BS, Iskandar J, Partasasmita R. 2019. Hobby and business on trading birds: Case study in bird market of Sukahaji, Bandung, West Java and Splendid, Malang, East Java (Indonesia). *Biodiversitas* 20: 1316-1332. Bird species have various ecological and socio-economic-cultural functions for the human being. Ecologically, birds have beneficial functions in the ecosystem, such as helping plant pollinators, spreading plant seeds, participating in controlling agricultural pests, and monitoring environmental changes. Meanwhile, bird functions for the social-economic and culture of the community among them are known as sources of protein food, mystical functions, sources of material stories, sources of inspiration to make songs, craft materials, the source of gene pool, and become pets and trade animals. With the rise of the urban population hobby of raising birds and also the development of various bird contest activities in the urban, causing of the bird trade is very widespread in urban areas, such as in bird markets. In some cities in Indonesia, various bird markets have been popularly known for a long time. This study aimed to elucidate species diversity, folk classification, bird populations, bird prices, constraints to bird trade, and the positive and negative effects of bird trade in the urban bird market. The research method used a mixture of qualitative and quantitative methods with the ethnoecological approach. The results of this study showed that from a survey of 60 bird traders in the bird market of Sukahaji, Bandung, and Splendid, Malang, a total of 160 bird species, representing 38 families were documented. Among them, 10 species representing 7 families recorded as protected bird by law in Indonesia, based on recent government regulation of the Minister of Environment and Forestry of Republic of Indonesian No.106/MENLHK/SETJEN/KUM.1/12/2018. A total of 2,950 individuals were recorded in Sukahaji; while in Splendid were recorded 3,558 individuals. Prices of birds that are traded varied greatly depending on the species and characteristics of birds. It has been revealed that bird trade in the bird market has been various economic benefits for many people. However, due to the bird trade in bird markets in the city which has not been properly managed, the sustainability system of the bird trade in the city is very alarming caused of many factors, including decreasing of bird population over time in rural ecosystem as main supply of urban bird trading in the bird markets. Therefore, bird trading in the bird markets must be properly managed based on the sustainable development program concept, namely pro-economic, pro-social, and pro-environment.

Keywords: hobbies for raising birds, bird markets, bird conservation, and bird trade

INTRODUCTION

Indonesia has rich bird species. It has been recorded at least 1,672 bird species consisting of 427 endemic species documented in Indonesia (Iskandar 2017). Thus, based on the global bird diversity, Indonesia takes the fourth position in the list of World's richest bird countries, after Columbia, Peru, and Brazil, and is first for endemism. Birds are both popular and important in terms of ecological and socio-economic-cultural function. Regarding ecological functions, birds have important function as plant pollinators, seed dispersal, agricultural pest controller, and used as indicators of climatic changes, and pesticide and environmental pollution (Iskandar 2017; Partasasmita 2015; Partasasmita et al. 2017). While in terms of socio-economic-cultural functions, birds are globally in different culture in the world recognized as hunting animals for food and pet, trading, environmental tourism, source of fables, tales, stories, folk songs, proverb, symbolic, myths, and

magic (De Roos 1981; Supriyadi et al 2008; Bezerra et al. 2011; Jepson 2011; Alves et al. 2013; Licarino et al. 2013; Pachekenan et al. 2013; Roldan-Clara et al. 2014; Teixeira et al. 2015; Dandeiya et al. 2015; Kinchot et al. 2015; Welianje et al. 2015; Iskandar et al. 2016; Iskandar 2017; Partasasmita et al. 2016; Soendjoto 2018).

Public interest in birds in Indonesia has a long history. Since birds have plumage, behavior and songs are conspicuous and attractive, the birds have been very popular as pet animals and kept in cages. Culturally, in the past, a Javanese man was considered his life successful and perfect if he had 5 aspects, namely having a job (*narpada*), a house (*wismo*), a vehicle (*turangga*), a wife, and a pet of bird (*manuk* or *kukila*) (Iskandar 2014). As a result, the live bird keeping has been a popular and important role in Javanese households. Culturally, in the past one of the birds was considered as a bird carrying good luck in life mainly zebra dove (*perkutut-Geopelia striata*). Moreover, this bird species had been popular as a birdsong

competition (Iskandar 2017). Similarly, it has also been culturally used as birdsong competition in South Thailand (Kirichot et al. 2015).

Recently, cage birds as pet animal have been more popular due to lots of people, particularly urban people due to growing to keep the live bird as a hobby, captive breeding business, and for the benefit of the singing bird contest. Because the demand for birds in urban areas has increased, the bird trading in bird markets in many urban areas of Indonesia are very popular. Bird trade has become a live hood for some people, particularly bird traders of urban bird market. As the demand for birds in urban areas has increased over time, the intensive illegal bird hunting in rural areas is also increasing. In addition, because of development of the birdsong competition in local, regional, and national in many urban areas of Indonesia, various bird species, particularly birds that have been popularly involved in birdsong competition caused of rising bird prices and increasing of illegal hunting in many rural areas of Indonesia (Iskandar 2014; Iskandar and Iskandar 2015).

Today, almost every town of sub-district, municipality, and province of Indonesia has been found the bird market (Iskandar 2017; Shepherd and Cassey 2017). Some bird markets, including bird market of Pramuka and Jatinegara (Jakarta), Barito (Central Kalimantan), Bintang (Medan, Sumatra); Bratang (Surabaya, East Java), Splendid (Malang, East Java); Pasty (Yogyakarta), Depok (Solo, Central Java), Karimata (Semarang, Central Java); Pasar Anyar (Bogor, West Java), and Sukajadi (Bandung, West Java), have been popularly known in Indonesia. The bird markets have been important as the traditional market has been an important function for people's economic activities. However, in addition to providing economic benefits to the community, trade in birds in markets that are not managed properly can cause one of the factors that cause a decline in wild populations in the wild, and can even threaten the extinction of birds in nature. The effort of bird hunters to catch maximum numbers of birds for trading in the urban bird markets, it has been causing endangers for the survival of many species in many rural areas of Indonesia.

Some research aspects, including bird diversity, population, and bird price on bird traded in the bird markets in Indonesia were undertaken by some scholars (Iskandar 1980; Basuni and Setyani 1989; Widodo 2007; Haryoko 2010; Prakosa and Kurniawan 2014; and Chng et al. 2015; 2016). In this paper, five aspects namely species diversity, folk classification, population, bird price, and positive and negative impacts of bird trading in the bird markets will be discussed, based on a case study in the bird market of Sukahaji, Bandung, West Java, and bird market of Splendid, Malang, East Java.

MATERIALS AND METHODS

Study site

Study was conducted in two bird markets places namely bird market of Sukahaji, Bandung, West Java, and bird market of Splendid, East Java, Indonesia (Figure 1). The study was conducted in 2013, 2015, and 2018. However, this paper was mainly based on research conducted in 2015. Geographically, Bandung is located at $6^{\circ} 55' 19''$ S, $107^{\circ} 36' 24''$ E, while Malang is located at $7^{\circ} 58' 48''$ S, $112^{\circ} 37' 12''$ E.

The urban bird market can be categorized as one of the Indonesian traditional markets. The traditional market may be defined as the traders and buyers meet, places where the supply and demand activities of buying and selling commodities, including birds between traders and buyers, occurs (Iskandar et al. 2018).

Based on ecological history, the existence of bird market of Bandung has been a long time, at least it was recorded in the 1960s. Initially, the bird market of Bandung was found on the edge of bus terminal of Kebun Kelapa. In addition, some bird traders have recorded selling of birds in along roads, including the north of train station in Jalan Kebon Kawung. At the beginning of 1970s, the bird market of Kebun Kalapa was moved to bird market of Sukahaji, behind of bus terminal of Leuwi Panjang, in Jalan Peta Bandung.

Figure 1. Map of study sites: Bird Market of Sukahaji, Bandung Municipality, West Java, and Bird Market of Splendid, Malang Municipality, East Java (Indonesia).

Bird market of Sukahaji Bandung, West Java, has an area around 5,800 m² consisting of 152 kiosks belonging to bird traders. Outside the bird market on the sidewalk of Jalan Peta, there are also found some bird traders who install non-permanent kiosks that are demolished every day by their owners. In the afternoon, the trades are usually brought their birds to the homes (Figure 2).

Like bird market of Sukahaji, bird market of Malang, East Java has been existing for a long time. It was recorded at least in the 1960s. Initially, the bird market of Malang was located in Jalan Brawijaya. In the period between 1967 and 1993, the bird market of Malang was moved to Comboran market because it caused traffic congestion. Moreover, from 1993 to 2001 bird market of Comboran market was moved again to former location in Jalan Brawijaya because the location of bird market at Comboran was constructed a school. In 2001, the market was moved from Jalan Brawijaya to bird market of Splendid located between Jalan Brawijaya and Jalan Majapahit. The name of Splendid has been taken from the name of hostelry in the Dutch era, called as Splendid Inn which is located not far from the location of the current bird market. The bird market area of Splendid has an area approximately 15,762 m². Between Jalan Brawijaya and Jalan Majapahit for about 200 m, it was recorded kiosks owned by 400 bird traders (Figure 3). The bird market of Splendid unites with both flower and fish markets.

Methods

The method used in this study was mixed-method between qualitative and quantitative methods with ethnoecological approach (Anderson et al. 2011; Albuquerque et al. 2014; Iskandar 2018). Some techniques, including observation, semi-structured interview, structured interview, and recording of bird species traded in the Sukahaji bird market, Bandung, West Java, and the Splendid bird market, Malang, East Java.

This study was conducted by observing the local environmental conditions of bird markets, including both

permanent and non-permanent kiosks, various foods, and cages of birds traded in both bird market of Sukahaji, Bandung, and bird market of Splendid, Malang. The semi-structured interviews were conducted to competent informants, including bird traders, bird sellers, and market managers that are purposely selected. Some aspects were discussed with informants, including the history of bird market, species of birds traded, bird prices, the origin of bird acquisition, and constraints to bird trade. The structured interviews were carried out with 60 respondents, consisting of 30 respondents of bird traders of Sukahaji and 30 respondents of Splendid. The structured interviews used questionnaire sheets that make various questions, such as education level, interest in selling birds, number of species and individual bird traded, and prices of birds, education level, interest in selling birds, obstacles in trading birds, were asked to respondents. For the bird identification, some field guidebooks including King and Dickinson (1975), Chang (1980), MacKinnon et al. (1992), Beehler et al. (1986), and Coates and Bishop (2000) were used.

Data analysis

The qualitative data collected by observation and semi-structured interview were analyzed by cross-checking, summarizing, synthesizing, and making description with descriptive and evaluative analysis, while quantitative data collected by questioners were analyzed by simple statically computing that is calculated by formula as follow (Newing et al. 2011; Iskandar 2017):

$$P = \frac{f}{N} \times 100\%$$

Where:

P = percentage of the total answer of respondents

f = number of respondent answers

N = total respondent

Figure 2. Some bird traders who install non-permanent kiosks outside the bird market, on the sidewalk of Peta Bandung Street, West Java.

Figure 3. Bird market in Splendid, Malang, it was recorded kiosks owned by some bird traders

Moreover, the result of statically computing, namely the percentage of respondent answering, was narrated with descriptive and evaluative analysis (Newing et al. 2011; Iskandar 2017). In addition, to know the dominance of each bird species trading recorded from respondents were analyzed by using dominance index (Jorgensen 1974; Iskandar 2014), as follow:

$$D_i = \frac{N_i}{N} \cdot 100 \% \text{ or } D_i = 100 \cdot p_i$$

Where:

D_i = dominance value of bird species i ;

N_i = number of bird individuals of the i -th species in community;

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

N = the total number of bird individuals in the community (N is equal to the sum of all N_i)

Based on the individual numbers of each bird species, it can be classified into 3 dominance classes: $D_i=0-2\%$ (non-dominant), $D_i=2-5\%$ (sub-dominant), and $D_i>5\%$ (dominant) (Jorgensen 1974; Iskandar 2017).

RESULTS AND DISCUSSION

Education level and trading interest of bird traders

Bird market of Sukahaji, Bandung and bird market of Splendid, Malang are categorized as traditional bird market. One of main characteristics of traditional markets, including traders and buyers meets; places where the supply and demand activities of buying between traders and buyers occur. In terms of physical condition, the kiosks are made of simple one. Buying and selling activities are achieved by bargaining which is made of possible by acceptance of a sliding price system. In bargaining, social relations are culturally activated (Supangkat 2012; Iskandar 2018). Another characteristic of the traditional market is each trader who involves in trading does not need to have a high education level and special formal skills. As long as they have a strong desire to trade in the traditional markets, including bird market, can be involved.

Based on education level of respondents of bird traders of Sukahaji Bandung and bird traders of Splendid Malang, it

was revealed that the respondents have dominant primary school (Table 1).

It can be seen from Table 1 that the education level of the bird traders, in general, have not provided specifically with higher education, but they have a strong willingness to trade birds, and their knowledge of various types and various aspects of bird life that they trade is obtained more than local knowledge (indigenous knowledge, traditional ecological knowledge-TEK). As mentioned by Berkes (2008) the Traditional Ecological Knowledge (TEK) is that 'a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with the environment'. Thus, bird traders have various knowledge on birds, including species, races, singing, food, disease, and breeding aspects have predominantly obtained from the parents, friends and individual learning of trial and errors instead of from literatures or scientific Western knowledge (cf. Puri 1997; 2005; Iskandar 2014; Iskandar and Iskandar 2015; Iskandar 2018).

In general bird traders of both Sukahaji, Bandung, and Splendid, Malang has experienced in trading birds for a long time, in average more the 15 years, even some bird traders have involved in bird trading more than 20 years. Because of since childhood, they have been involved in maintaining and trading bird for assisting the parents to sell birds in the bird market. Then after their parents died, the bird trade business in the bird market was continued by their sons.

In terms of interesting in bird trading, it has been revealed that many respondents of both in Sukahaji, Bandung and Splendid, Malang they have interested in bird trading in the bird markets because trading birds provides economic benefits for the family; besides providing economic benefits to the family as well as doing hobby activities, continuing the business of parents, and because of their low education and no alternative business fields (Table 2). This result is similar to that of conducted research in the bird market of Pramuka and Jatinegara, Jakarta, that the bird traders in the market are interested in being involved in the bird trade, among others because of economic benefits (57.4%), limited employment opportunities (14.7%), has been passed down from generation to generation (24.8%), and influences the invitation of friends (3.3%) (Widodo 2007).

Table 1. Education level of respondents of bird traders of Sukahaji, Bandung and bird traders of Splendid, Malang (2015)

Education level	Bird market of Sukahaji, Bandung		Bird market of Splendid, Malang	
	Respondent number	Percentage of the total	Respondent number	Percentage of the total
Elementary school	13	43.33	15	50.00
Primary high school	4	13.33	5	16.66
Secondary high school	9	30.00	9	30.00
University/Diploma	4	13.33	1	3.33
Total	30	100.00	30	100.00

Table 2. Various reasons for involving in bird traders in bird market of Sukahaji, Bandung and involving in bird traders in bird market of Splendid Malang (2015).

Various reason	Bird market of Sukahaji, Bandung		Bird market of Splendid, Malang	
	Respondent number	Percentage of the total	Respondent number	Percentage of the total
Economic needs	6	20.00	8	26.66
Hobbies and economic needs	19	63.33	17	56.66
Continuing of the parent business	3	10.00	2	6.66
Low education and no other jobs	2	6.67	3	10.00
Total	30	100.00	30	100.00

Table 3. Perception of bird traders on various constraints in involving of the trading birds in bird market of Sakahaji, Bandung and Splendid, Malang (2015).

Various constraints	Bird market of Sukahaji, Bandung		Bird market of Splendid, Malang	
	Respondent number	Percentage of the total	Respondent number	Percentage of the total
Birds die because of weather, wind, and escape from confinement	11	36.67	13	43.33
Birds are sometimes difficult to sell	6	20.00	5	16.66
The cost of bird care is quite expensive	7	27.33	6	20.00
Birds are returned by buyers because they are not satisfied	3	10.00	2	6.66
Reduced bird supply	2	6.67	1	3.33
Birds are not sold well due to bird flu issues, and other regulations on bird trade	1	3.33	3	10.00
Total	30	100.00	30	100.00

Table 4. Bird species diversity recorded in bird market of Sukahaji, Bandung and bird market Splendid, Malang (2015).

Location	Species number	Family number	Protected bird species number
Sukahaji bird market, Bandung	128	38	9
Splendid bird market, Malang	116	32	6
Total	160	38	10

It can be seen from Table 2 that the bird trading in the bird market provides economic benefits to the family, and is used as an income for economic benefits and distribution of hobbies, also some obstacles in trading birds have frequently occurred. The predominant constraints have affected bird traders, including the death of birds, birds sometimes not selling well, high costs of raising birds, birds returned by unsatisfied buyers of birds bought, reduced supply of birds, especially decreasing supply from bird hunters of villages, and issues like the issue of bird flu and there will be a ministerial regulation of 2018 that will regulate bird trade by the government (Table 3).

Bird species

On the basis of an inventory of bird species that are traded from respondents of bird market in bird market of Sukahaji, Bandung and bird market of Splendid, Malang has been recorded 160 bird species representing of 38 families (Table 4).

It can be seen from Table 4 that total bird species recorded in the bird market of both Sukahaji, Bandung, and

Splendid, Malang are considered to be high diversity. This result is rather similar to that of recorded by other researchers in other bird markets, including Parmuka and Jatinegara, Jakarta; Perintis, Garut and Lingajaya, Tasikmalaya, West Java; and Barito, Central Kalimantan, the bird species were recorded generally high diversity. For example, based on the bird inventory in bird market of Sukahaji, Bandung, Pramuka and Jatinegara, Jakarta, and Splendid, it was recorded more than 100 species. While the total bird species recorded in the bird markets of Perintis, Garut and Lingga Jaya, Tasikmalaya, West Java; and Barito, Central Kalimantan were less than 100 species. For instance, based on Chng et al. and our research in Sukahaji market of Bandung, it was recorded 128 species, and 178 species, respectively. Exceptionally, survey conducted Haryoko in Sukahaji bird market, it was recorded only 44 species, because it was surveyed on very limited bird traders. (Table 5).

In general, the total species in the bird market of big cities, such Jakarta, Bandung, and Malang is higher than that of bird market in sub-district urban areas, such as Garut and Tasikmalaya because various species, including birds of local of Java, Western Indonesia, Eastern Indonesia, and imported birds have predominantly traded in the bird markets in big cities, while the local birds of Java have been dominated traded in the markets of sub-district urban.

Based on bird survey, it has also been revealed that although based on the Act of the Republic of Indonesia No 5 of 1990 concerning Conservation of Living Resources and their Ecosystem, and the Government Regulation No. P 92/Menlhk/set.jen/Kem.1/2018, Concerning the Preservation of Flora and Fauna, the protected birds are formally

prohibited to sell in the bird market, it was recorded 10 species representing 7 families of protected birds in the bird market of Sukahaji, Bandung, and Splendid, Malang (Table 6) (Figures 4-5). Even among the protected bird species, 2 species namely *Falco moluccensis*, *Leucopsar rothschildi* are categorized as threatened species based on the IUCN Red List. Indeed, based on the Convention on International Trade in Endangered of Wild Fauna and Flora (CITES), *L. rothschildi* is listed in Appendix 1, so it is strongly prohibited for trading (Soehartono and Mardiatuti 2003).

Indeed, some protected bird species that are illegally traded in the bird markets have commonly traded in bird markets, as also reported by other scholars, including Iskandar (1980) and Chng et al. (2015; 2016) who conducted research is birds market in Indonesia. Many birds protected by law have been commonly traded in the bird market, partly because the price of these birds is expensive and the strong action against violators of the law is not strictly undertaken by the government. Consequently, the violation of law has been predominantly done by many people.

Folk classification of traded birds

Based on informants various birds traded at the bird market of Sukahaji, Bandung and the bird market of Splendid, can be classified as folk classification (cf. Berlin

et al. 1973; Iskandar 2018) into 5 groups: bird sources, bird tame, bird singing, participation in bird song contests, and bird prices.

Bird sources

The species of birds traded in the bird market both Sukahaji, Bandung and Splendid, Malang can be grouped based on sources, namely local domestic bird species from different regions in Indonesia and the imported bird species from abroad. Moreover, the local Indonesian domestic birds can be grouped into Indonesian local bird species, from Western Indonesia, such as Java, Sumatra, and Kalimantan. Indeed, some of these birds, including birds endemic to Java such as bultok (*Megalaima corvina*), Java and Bali, such as tohtor (*Psilopogon armilaris*), sparrow (*Padda orizivora*), and cekakak (*Halcyon cyanoventris*) are commonly recorded. Some birds of Eastern Indonesia, including kakatua putih jambul kuning (*Cacatua galerita*) and nuri (*Ecletus roratus*) of Papua are frequently recorded in the bird market. Regarding imported birds, some birds species, such as poksay/hwamei (*Garrulax canorus*) and poksay putih (*Garrulax chinensis*) are predominantly recorded, while some bird species from non-Asian countries, such as Africa, mainly love-bird (*Agapornis* sp.) are dominantly recorded in bird market (Howard and Moore 1984).

Table 5. Species diversity recorded in bird markets of Indonesia in the period between 1980 and 2016

Location of bird market	Species diversity	Source
Kebun Kelapa, Bandung, West Java	117 species, 32 families	Iskandar 1980
Sukahaji, Bandung, West Java	44 species, 22 families	Haryoko 2010
Perentis, Garut, West Java	43 species, 22 families	Haryoko 2010
Linggajaya, Tasikmalaya, West Java	37 species, 22 families	Haryoko 2010
Pramuka, East Jakarta	180 species	Chng et al.2015
Jatinegara, East Jakarta	106 species	Chng et al.2015
Barito, Central Kalimantan	65 species	Chng et al.2015
Splendid, Malang, East Java	148 species	Prakosa dan Kurniawan 2015
Sukahaji, Bandung, West Java	178 species	Chng et al. 2016

Figure 4. Ekek keling (*Cissa thalassina*) is one of protected birds in Indonesia based on the government regulation of the Minister of Environment and Forestry No. P 92/Menlhk/2018 was recorded in Sukahaji bird market, Bandung

Figure 5. Burung kipas (*Rhipidura javanica*) is one of protected birds in Indonesia based on the government regulation of the Minister of Environment and Forestry No. P 92/Menlhk/2018 was recorded in Splendid bird market, Malang

The species of birds traded on the bird market can also be classified based on the types of birds caught from nature (*burung tangkapan*) and the captive breeding of bird breeders (*burung tangkaran*) in Indonesia. The species of catch birds can be defined as the species of birds that are traded in the bird market of Sukahaji, Bandung, and the bird market of Splendid, Malang. It can be divided into two groups: firstly the birds that have been caught from the villages brought to the urban and they are immediately displayed in kiosks at the urban bird market. Secondly, the bird species that have been caught from the villages have not been directly displayed in kiosks at the bird market, but they are adapted in several weeks in the home of the bird traders. Moreover, after birds have been adapted and become rather tame, they are brought from the home of bird traders and displayed in the kiosks of bird market to be sold in the bird market.

Catching bird species are generally categorized as local bird species. Meanwhile, captive breeding birds are the species of birds that are traded in the bird market from the breeders in the urban. The breeding birds can be local birds or initially imported birds that have been breeding by bird keepers and bird breeders in the urban.

Tame character

Various species of birds by traders at the bird market are also classified based on the types of 'wild birds' (*burung garabagan*) and 'tame birds' (*burung sudah jinak* or *burung jadi*). The wild birds may be defined as new birds that have been directly caught from various habitats of the rural ecosystems. The birds have distinctive characteristics, including still strongly depended on natural foods, still afraid of people, and even though categorized as songbirds, they do not want to sing because they have not been able to adapt in cages or cages in the market. The species of birds are generally local birds and birds are not the result of breeding captivity, have not been maintained for a long time by bird traders, and so that they have not been adapted in cages or cages in the market.

Unlike 'wild birds', 'tame birds' are birds that have been domesticated because they have been kept for a long time by bird keepers or bird traders, then traded at the bird market. The species of birds that are captured from nature, if captured are still in the form of their young individuals or pouts taken from their nests, then raised by breed keepers or bird traders, then traded at the bird market can change from a status of birds of 'wild birds' to a status of 'tame birds'. The bird species can adapt in the environment of cage, the feed is no longer natural feed, but given artificial feed, including food pellets, crickets, caterpillars and bananas that are predominantly traded in the bird market. They become tame distinctive characters, including not afraid of human beings and want to sing. In addition, the species of non-capture birds namely results from the captive breeding are categorized as 'tame birds'.

Birdsong

The species of birds can also be classified by informants of bird traders or bird keepers as well as

birdsong contest hobbies in the urban, namely 'songbirds' and 'non-songbirds'. Some 'songbirds' are known by bird traders, namely local birds, such as murai (*Copsychus saularis*), murai batu (*Copsychus malabaricus*), anis merah (*Zoothera citrina*), and beo (*Gracula religiosa*). While the songbirds of non-local species, including poksay putih (*Garrulax chinensis*), hwamei (*Garrulax canorus*), and love bird (*Agapornis* sp.) are popularly known by bird traders (Iskandar and Iskandar 2015). While the rest of bird species, including birds of family of Accipitridae, Falconidae, Deceidae, and Ploceidae are predominantly categorized as non-birdsong based on the folk classification.

Birdsong contest

Various species of bird trade in the bird market can also be classified based on the categories of 'song contest birds' and 'non-song contest birds'. This classification of birds has been famous after the popular habit of birdsong contests undertaken by songbird lovers in the 1980s. At that time, the cucak rawa (*Pynonotus zeylanicus*) was mainly contested in the songbird bird contests in many urban areas in Indonesia. Then, because the population of the cucak rawa has dramatically decreased in nature, and the Ministry of Environment (KLH) banned the contest for this species, except for bird results of captive breeding is still allowed. Then the species of birds contested have changed from the cucak rawa to imported birds, such as poksay/hwamei (*Garrulax canorus*) and poksay putih (*Garrulax chinensis*). However, as a result of the Indonesian monetary in 1998, the price of imported birds became expensive, and there was also the issue of bird flu which was worried to be carried by imported bird species. As a result, species of imported hwamei and pokay birds were less popular and rarely contested again. Moreover, some local songbirds, including anis merah (*Zoothera citrina*) and murai batu (*Copsychus malabaricus*) have been popular.

Today, various birdsong contests in many urban in Indonesia are very popular. In general, bird contest activities in Indonesia can be divided into 3 levels, namely local/for training, regional, and national level. At the local level, such as bird contests in the Bandung urban areas and its surroundings are routinely conducted once a week, held almost every day in many areas of Bandung (Iskandar and Iskandar 2015).

In general, bird contests at the local level are primarily intended for bird training purposes (*untuk latihan*) in contests and can enhance the selling prices. The reason is birds that have been winners in local cases, the selling price becomes expensive. In addition, moreover, the contest activities are also a means of preparation to participate in contests at the regional or national level.

Some local and imported birds, including murai batu (*Copsychus malabaricus*), murai Boeneo (*Copsychus malabaricus* var *borneo*), anis merah (*Zoothera citrina*), anis kembang (*Zoothera interpres*), murai/akacer (*Copsychus saularis*), ciblek (*Prinia familiaris*), cucak jenggot (*Criniger bres*), toed/pentet (*Lanius schach*), pleci

kacamata (*Zosterops palpebrosa*), kenari (*Serinus canarius*), love bird (*Agapornis* sp.), and parkit (*Melopsittacus undulatus*) have been predominantly contested in many urban areas of Indonesia (Iskandar and Iskandar 2015).

In general, for national level contests, birds that are included as contestants of bird song contest must be result of captive-bred birds, marked with their foot rings installed. However, for the songbird contests at the local level, the birds that are commonly contested have not been installed foot rings. In other words, those birds have resulted in the captive breedings, they have originally captured from nature and have been kept for a long time by the owners. Therefore, since the local songbird contests have been popular in urban areas, the intensive bird hunting activities have been increasingly carried by rural people because of those bird species have high prices in the bird markets.

Conversely, some birds have not been involved in bird song contest, they are classified by bird sellers of the bird market both Sukahaji, Bandung, and Splendid, Malang as non-contest birds (*bukan jenis burung kontes*).

Bird price

The species of birds traded at the bird market can also be classified as bird species which have high prices and have low price birds. The group of species have been categorized as expensive prices, including song birds; beautiful feathers; tame; and commonly involved in birdsong contests. On the other hand, bird species have been categorized as cheap prices, including not beautiful; bad behavior; unattractive colors; and not tame or not domesticated. Thus, in many cases even though a species of bird is an actually categorized as birdsong, and have beautiful feather, but not yet tame, then the price of the bird can be cheaper than non-song birds, but has been tame or has been kept for a long time and has been adapted in cages.

Based on the folk classification (Iskandar 2018), it has been revealed that the folk classification is different from that of rural people. As mentioned earlier, traded bird is classified by bird traders based on their sources, tames, song, participation in song contests, and the prices. Unlike bird traders, the rural people of West Java classify bird species based on distinctive voice/vocalization, morphological characteristics, special colors, distinctive behaviors, time activities, nest types, habitats, migrants, and role in the ecosystem (Iskandar et al. 2016)

In terms of the traditional ecological knowledge (TEK), it can be seen the community of bird traders in the urban, classifying bird species is mainly based on their knowledge and practice in bird keeping and bird trading and handed down through generations by cultural transmission, while classifying bird species by local rural community, is predominantly based on knowledge, practice, and belief in interacting with species of birds in nature in their local

ecosystems rather than pet birds in cages, which are culturally transmitted through generations (cf. Berkes 2008).

Bird population

Based on direct observation and interview with 60 respondents of bird traders in the bird market of Sukahaji, Bandung and Splendid, Malang, it was totally documented 162 bird species, representing 41 families. Of bird individual was totally recorded 6,508 individuals of birds, namely in the bird market of Sukahaji, Bandung recorded 2,950 individuals, while in the bird market of Splendid, Malang recorded 3,558 individuals (Table 6).

Regarding population composition of 128 bird species in Sukahaji bird market, and 166 bird species in Splendid bird market, consisted of 3 dominant, 11 sub-dominant species, and 4 and 7 sub-dominant, respectively (Table 7).

Among dominant and sub-dominant species of bird in Sukahaji bird market, Bandung, and bird market of Tasikmalaya and Garut (Haryoko 2010) were categorized as common bird category documented in rural areas of West Java. For example, pipit (*Lonchura leucogastroides*), kutilang (*Pycnonotus aurigaster*), perkutut (*Geopelia striata*), tekukur (*Streptopelia chinensis*), and burung kacamata/pleci (*Zosterops palpebrosa*) were predominantly recorded in some rural areas of West Java (Iskandar 1980; Iskandar et al. 2016).

Like Sukahaji bird market, dominant and sub-dominant species, including kutilang (*Pycnonotus aurigaster*), burung kaca mata/pleci (*Zosterops palpebrosa*), cerocokan/jogjog (*Pycnonotus goiavier*), bondol (*Lonchura maja*), pipit (*Lonchura leucogastroides*), peking (*Lonchura punctulata*), prit benggala (*Amadava amandava*), and perkutut (*Geopelia striata*) were recorded in Splendid, Malang, were recognized as common bird species of rural ecosystem of West Java (Table 8; Figures 6-9). Most of these species have been commonly found in various habitats, including the homegarden, mixed garden, secondary forest, and rice field, except for bondol and prit benggala are commonly only found in the rice field for eating the seeds of paddy (Iskandar 1980).

In addition, some species of birds that are categorized as dominant and sub-dominant in bird market of Sukahaji, Bandung, and Splendid, Malang were captive breeds, such as kenari (*Serinus canarius*), parkit (*Melopsittacus undulatus*), love bird (*Agapornis* sp.), and dove (*Columbia livia*). In general some dominant and sub-dominant bird species were traded in Sukahaji, Bandung, and bird markets, Splendid, such as kutilang (*Pycnonotus aurigaster*), cerojokan/jogjog (*Pycnonotus goiavier*), pipit (*Lonchura leucogastroides*), peking (*Lonchura functulata*), and burung kaca mata/pleci (*Zosterops palpebrosa*), also dominantly traded in the Pramuka market, Jakarta (Chng et al. 2015).

Table 6. The total species, total individual, and index of abundance of each bird species traded in bird market Sukahaji, Bandung and bird market of Splendid Malang (2015).

Species & family	Local name	Sukahaji Bandung, West Java		Splendid Malang, East Java	
		Individual number	Index of abundance	Individual number	Index of abundance
Alaudidae					
<i>Mirafra javanica</i>	Branjangan, Titimplik, Apung	20	0.667	31	0.871
Alcedinidae					
<i>Halcyon cyanoventris</i>	Burung udang, Burung hurang, Raja udang biru, Cekakak, Cekahkeh, Kahkeh, Kakak gunung, Celepuk hutan	2	0.067		
<i>Halcon chloris/Todirhampus chloris</i>	Cekahkeh, Burung udang, Raja udang, Tengkek, Tetengkek putih, Cekakak, Gasngek, Pekaka	1	0.033	5	0.140
Artamidae					
<i>Aramus leucorhynchus</i>	Manuk buah, Dedet, Kekep, Katekak	2	0.067		
Cacatuidae					
<i>Cacatua galerita</i> *)	Kakatua putih jambul kuning	1	0.033		
Campepahidae					
<i>Lalage nigra</i>	Kapasan, Manuk muncang	4	0.135	1	0.028
<i>Pericrocotus cinnamomeus</i>	Antenan, Manten, Burung sepah	2	0.067	15	0.421
<i>Pericrocotus flammeus</i>	Burung sepah, Manten			3	0.084
<i>Pericrocotus miniatus</i>	Antenan, Manten, Burung sepah	2	0.067	7	0.196
Capitonidae					
<i>Megalaima armillaris</i>	Tohtor, Carang-carang	2	0.067		
<i>Megalaima australis</i>	Ungkut-ungkut gunung, Tenggeret, Truntung			3	0.084
<i>Megalaima corvina</i>	Engkut-engkut, Burung tukong, Burung takau	2	0.067		
<i>Megalima hamecrphala</i>	Ungkut-ungkut, Engkut-engkut, Burung tukong, Burung takau	2	0.067		
<i>Psilopogon pyrolophus</i>	Cucak raja, Takur api	1	0.033	1	0.028
Cardinalidae					
<i>Paroria sp</i>	Kardinal	2	0.067		
Chloropseidae					
<i>Aegithina tiphia</i>	Cipeuw, Cipo, Cito	10	0.338	9	0.252
<i>Chlorosis cochinchinensis</i>	Cicak daun	35	1.186	68	1.911
<i>Chloropsis sonnerati</i>	Cicak daun	20	0.667	59	1.658
Columbidae					
<i>Chalcocophaps indica</i>	Delimukan	6	0.203		
<i>Columbia livia</i>	Merpati, Japati, Jepati: Burung dara (biasa, gondok, jerman, kipas, pos)	341	11.796	144	0.047
<i>Ducula badia</i>	Kedanca, Pergam gunung	2	0.067		
<i>Geopelia striata</i>	Perkutut, Ketitiran, Merbok	119	4.033	57	1.602
<i>Macropygia phasianella</i>	Burung uncal			8	0.224
<i>Macropygia unchall</i>	Burung uncal, Uncal kedanca, Tekukur api	1	0.033		
<i>Streptopelia bitorquata</i>	Dederuk, Puter, Putar	12	0.406	11	0.309
<i>Streptopelia chinensis</i>	Tikukur, Tekukur, Derkuku, Balam, Bulu huo	106	3.593	62	1.742
<i>Treeron vernans</i>	Walik, Katik, Punai, Putri manik	1	0.033		
Corvidae					
<i>Cissa thalassina</i> *)	Ekek keeling, Ekek geling, Ekek gelung, Keket geleng	2	0.067		
<i>Corvus enca</i>	Gagak, Engak	3	0.101	2	0.056
<i>Corvus macrorhynchos</i>	Gaok	2	0.067	1	0.28
<i>Platylolopus galericulatus</i>	Cililin, Tangkar ongkelet	3	0.101	1	0.28
Cuculidae					
<i>Cacomantis merulinus</i>	Kedasi, Sirit uncuing			2	0.056
<i>Centropus bengalensis</i>	Dudut, Bubut, But-but	3	0.101		
<i>Centropus sinensis</i>	Bubut, Dudut, Dudut celadak, Dudut candung, Dudut troktok, Kangkok Eurasia	2	0.067	2	0.056
<i>Cuculus canorus</i>	Tuweuw, Tuha, Tuhi, Two, Tuwu			2	0.056
<i>Eudynamys scolopacea</i>	Burung bueuk			2	0.056
Diceidae					
<i>Dicaeum sanguinolentum</i>	Cabe gunung, Kemande			2	0.056
<i>Dicaeum trigonostigma</i>	Seupah, Cabe-cabe gunung	2	0.067		
<i>Dicaeum trochileum</i>	Manuk manganeuh, Burung benalu, Burung cabai, Burung lombok, Cabe-cabe, Seupah, Kemande			2	0.056
Dicruridae					
<i>Dicrurus leucophaeus</i>	Saeran gunting abu-abu, Selagunting, Saeran, Jejipret	7	0.237	10	0.281

<i>Dicrurus macroceus</i>	Saeran gunting, Sela gunting, Sri gunting, Saeran, Jejipret	3	0.101	7	0.196
<i>Dicrurus paradiseus</i>	Saeran kerantil	2	0.067	2	0.056
Estrildidae					
<i>Phoeopila guttata</i> **)	Gelatik zebra, Zebra finch	5	0.169	3	0.084
Falconidae					
<i>Falco moluccensis</i> *) Ap II)	Alap-alap, Alap-alap sapi			1	0.028
Fringilidae					
<i>Carduelis</i> sp**)	Siskin	1	0.033	2	0.056
<i>Serinus</i> sp **)	Sanger	10	0.0338	2	0.056
<i>Serinus canarius</i> **)	Kenari, Burung knari	235	7.966	938	26.36
<i>Serinus atrogularis</i> **)	Blackthroat	42	1.423	15	0.421
Laniidae					
<i>Lanius schach</i>	Toed, Towed, Toet, Bentet, Tiup api	12	0.406	23	0.646
Leiothricidae					
<i>Leiothrix argentauris</i> **) sp	Pancawarna	3	0.101		1.967
<i>Leiothrix</i> sp **)	Robin	2	0.067	70	
Meliphagidae					
<i>Philemon novaguineae</i>	Kua-kura Irian	1	0.033		
Motacilidae					
<i>Motacilla cinerea</i>	Burung entod leuncang, Kicuit kerbau	2	0.067		
Muscipadae					
<i>Cyanoptila cyanomelana</i>	Sikatan biru putih			1	0.028
<i>Cyornis banyumas/ Muscicapa banyumas</i>	Anis bingbin, Ledekan, Tledakan, Sulingan	12	0.406	2	0.056
<i>Ficedula hyperythra</i>	Sikatan bodoh	12	0.067		
<i>Ficedula mugimaki</i>	Sikatan mugimaki			6	0.168
<i>Ficedula westermanni</i>	Sikatan belang, Sambar gunung			3	0.084
<i>Myiomela diana</i>	Cingcoang			1	0.028
<i>Myiophoneus caeruleus</i>	Ciung, Beo kali			3	0.084
<i>Myiopinus glaucinus</i>	Ciung	2	0.067		
<i>Rhipidura javanica</i> *)	Sapu, Burung kipas, Burung kipasan, Kipasan, Sikatan, Sisikatan	1	0.033	2	0.056
Nectariniidae					
<i>Aethopyga eximia</i>	Burung madu gunung			2	0.056
<i>Antreptes</i> sp	Kolibri			6	0.168
<i>Anthreptes malacensis</i>	Jantingan, Burung madu, Cuit, Isap madu, Patok madu, Burung madu kelapa, Kelicap mayang kelapa	1	0.033		
<i>Arachnothera longirostra</i>	Klaces, Patok jantung, Seuseup jantung, Burung jantung, Prit andung, Kricap jantung pisang	1	0.033	2	0.056
<i>Nectarinia</i> sp	Kolibri	1	0.033	6	0.168
<i>Nectarinia jugularis</i>	Cuit, Jantingan, Kicuit, Sriganti, Burung madu kuning	1	0.033		
Oriolidae					
<i>Irea puella</i>	Pentetan, Kacebang gadung	5	0.169	11	0.309
<i>Oriolus</i> sp	Kepodang tanduk	1	0.033		
<i>Oriolus chinensis</i>	Kepodang, Bincarung, Muntilan, Gulalhe, Burung kunyit besar	18	0.610	21	0.590
<i>Oriolus cruentus</i>	Kepodang hitam	1	0.033		
Paridae					
<i>Parus major</i>	Gelatik batu, Jing-jing latak, Jing-jing teureup	4	0.135	4	0.112
Phasianidae					
<i>Arborophila javanica</i>	Puyuh gonggong	3	0.101		
<i>Coturnix chinensis</i>	Puyuh telur	50	1.694	7	0.196
<i>Gallus</i> sp	Ayam mutiara	7	0.237	1	0.028
<i>Gallus varius</i>	Ayam hutan hijau			1	0.028
Picidae					
<i>Dendropus macei</i>	Platuk bawang	4	0.135	1	0.028
<i>Dinopium javanense</i>	Caladi kundang, Celadi kundang, Platuk, Belatok mas	5	0.169	1	0.28
<i>Picus puniceus</i>	Platuk sayap merah	2	0.067		
Pittidae					
<i>Pitta guajana</i> Ap II)	Paok, Beker paok, Burung cacing	2	0.067		
Ploceidae					
<i>Amandava amandava</i>	Prit mas, Prit benggala, Manintin	5	0.169	256	7.195
<i>Erythrura prasina</i>	Emprit hijau, Eusing, Engsring, Bondol hijau,	347	11.762	5	0.140
<i>Lonchura ferruginosa</i>	Gelatik ngungkuk, Binglis	100	3.389	30	0.843
<i>Lonchura leucogasroides</i>	Bondol, Bondol hitam	102	3.457	76	2.136
<i>Lonchura maja</i>	Pipit, Piit, Prit, Emprit	102	3.457	61	1.714

<i>Lonchura Malacca</i>	Bondol rawa	10	0.338		
<i>Lonchura punctulata</i>	Peking, Keting	40	1.355	80	2.248
<i>Padda oryzivora</i> *) Ap II)	Gelatik	60	2.035	6	0.168
<i>Passer montanus</i>	Geelejra, Galejra, Gereja	2	0.035	1	0.028
<i>Ploceus hypoxanthus</i>	Manyar mas		0.067	10	0.281
<i>Ploceus manyar</i>	Manyar	11	0.372	132	3.709
<i>Ploceus philippinus</i>	Manyar, Tampua, Manyar kembang	10	0.338		
Psittaculidae					
<i>Agapornis</i> sp **)	Lovebird (Holland, Taiwan)	101	3.423	281	7.897
<i>Cactua galerita</i> *) Ap II)	Kakatua putih jambul kuning	1	0.033		
<i>Ecletus roratus</i> *) Ap II)	Nuri, Nuri bayan	2	0.067		
<i>Eos</i> sp	Nuri			43	1.208
<i>Lorius garrulous</i> *)	Kasturi Ternate	5	0.169		
<i>Loriculus pusillus</i> *) Ap II)	Santinet, Serenet, Serindit Jawa	2	0.067	2	0.056
<i>Melopsittacus undulatus</i> **) TS, Ap I)	Parkit, Parkit Jawa, Parkit Holland	55	1.864	154	4.328
<i>Psittacula alexandri</i> Ap II)	Ekek, Betet, Bayan	5	0.169	2	0.056
<i>Trichoglossus</i> sp	Nuri			2	0.056
Pycnonotidae					
<i>Alophoixus bres</i>	Kutiang janggut, Empuluh Janggut	15	0.508	10	0.281
<i>Ixos malaccensis</i>	Bayeman	2	0.067		
<i>Pycnonotus</i> sp	Bimoli, Wilis			1	0.028
<i>Pycnonotus atriceps</i>	Kuricang, Kutilang daun, Burung siam	4	0.135	2	0.056
<i>Pycnonotus aurigaster</i>	Kutilang, Ketilang, Tilan, Cangkurileung	110	3.728	96	2.689
<i>Pycnonotus bimaculatus</i>	Cica rante, Kutiang mas, Tengtelok	4	0.135	9	0.252
<i>Pycnonotus goiavier</i>	Jogjog, Cerocokan, Cerucuk, Cukucuk, Celucuk	38	1.288	77	2.164
<i>Pycnonotus melanicterus</i>	Cucak kuning	3	0.101	5	0.140
<i>Pycnonotus zeylanicus</i>	Cucak rawa, Cica rawa, Cangkurawok, Barau-barau	2	0.067	3	0.084
Rallidae					
<i>Porphyrio porphyrio</i>	Pelung, Mandar, Dentula			4	0.112
Sittidae					
<i>Sitta azurea</i>	Mungkuk loreng, Saleser			2	0.084
<i>Sitta frontalis</i>	Mungkuk beledu, Saleser, Rambatan			3	0.056
Strigiformes					
<i>Otus lempiji</i> Ap II)	Bueuk, Burung Jambok	9	0.305	13	0.365
<i>Otus spilocephalus</i> Ap II)	Burung hantu			6	0.168
<i>Phodius badius</i> Ap II)	Burung hantu, Serak bukit			2	0.056
<i>Tyto alba</i> Ap II)	Burung hantu, Serak, Koreak	1	0.033		
Sturnidae					
<i>Acridotheres javanicus</i>	Jalak Kerbau, Kerak Kerbau, Kerak Munding, Jalak Penyu, Jalak Hitam, Kaleng Kerbau, Jalak Batam, Kerak Batam	55	1.864	12	0.337
<i>Acridotheres tristis</i>	Camperling, Perling kecil	63	2.135	23	0.646
<i>Aplonis minor</i>	Camperling, Cemperling			6	0.168
<i>Aplonis panayensis</i>	Perling, Jalak keeling	23	0.779		
<i>Gracula religiosa</i> *) Ap II)	Beo, Tiong (variasi Kalimantan)	25	0.847	24	0.674
<i>Leucopsar rothchuldi</i> *) TS, Ap I)	Jalak Bali, Jalak putih Bali, Curik putih, Curik Bali	1	0.033	6	0.186
<i>Scissirostrum dubium</i>	Rio-río, Jalak rio-río	35	1.186	2	0.056
<i>Sturnus contra</i>	Jalak suren, Jalak omas, Kerak omas	107	3.627	62	1.742
<i>Sturnus melanopterus</i>	Jalak putih, Jalak mutiara	12	0.406	2	0.056
<i>Sturnus nigricollis</i> **)	Kerak Thailand, Kerak sungko	5	0.169	2	0.056
Sylviidae					
<i>Orthotomus</i> sp.	Binter, Cucak binter	1	0.033	-	-
<i>Orthotomus ruficeps</i>	Prinjak, Cinenen, Nanangkaan, Esel nangka, Cilak-cilak	2	0.067	16	0.449
<i>Orthotomus sutorius</i>	Prinjak, Ciang-ciang, Cilak-cilak	3	0.101	4	0.112
<i>Phylloscopus trivirgatus</i>	Pare-pare, Cikrak daun			22	0.618
<i>Prinia familiaris</i>	Ciblek gunung, Ciblek Jawa, Ciblek kapas, Ciblek bodas	6	0.203	11	0.309
<i>Prinia flaviventris</i>	Ciblek gunung	5	0.169		
<i>Prinia inornata</i>	Perenjak padi			255	6.322
<i>Prinia subflava</i>	Pacikrak, Cici, Prenjak	2	0.067	10	0.281
Timaliidae					
<i>Garrulax conorus</i> **) TS, Ap I)	Wambi, Hwamei	2	0.067		
<i>Garrulax chinensis</i> **) TS, Ap I)	Poksay hitam	4	0.135		
<i>Garrulax leucolophus</i>	Poksay putih	4	0.135		
<i>Macronus flavicollis</i>	Kaci-kaci, Ciung air Jawa	1	0.033		
<i>Macronus gularis</i>	Cong-cong, Ciung air coreng, Cica bata	2	0.067		
<i>Pellorneus capistratum</i>	Pecah kopi, Burung kopi,	3	0.101		
<i>Pomatorhinus montanus</i>	Angklung	3	0.101	8	0.224

<i>Timalia pileata</i>	Burung kaso	4	0.135	20	0.562
Turdidae					
<i>Copsychus malabaricus</i>	Murai batu (Kalimantan, Lampung, Medan)	25	0.847	15	0.421
<i>Copsychus saularis</i>	Kacer, Haur, Murai (Jawa, Medan, Lampung, Kalimantan)	10	0.338	12	0.337
<i>Myiophoneus caeruleus</i>	Beo Kali, Ciung			3	0.084
<i>Myiophoneus glaucinus</i>	Ciung	3	0.101		
<i>Saxicola caprata</i>	Decu, Sengseongan	2		4	0.112
<i>Turdus obscurus</i>	Burung cacing, Cica kembang	35	1.186	3	0.084
<i>Zoothera sp</i>	Anis biru	3	0.101	2	0.056
<i>Zoothera citrina</i>	Anis merah, Burung cacing, Punglor	56	1.898	2	0.056
<i>Zoothera dauma</i>	Anis macan, Anis sisik	3	0.101		
<i>Zoothera interpres</i>	Anis kembang, Anis batur	4	0.135	13	0.365
<i>Zoothera sibirica</i>	Anis kembang, Burung cacing, Burung cacing gunung			4	0.112
Turnicidae					
<i>Turnix suscitator</i>	Puyuh tegalan	2	0.067		
Zosteropidae					
<i>Lophozypterus javanicus</i> *)	Kacamata, Pleci, Opor-opior	10	0.338	8	0.224
<i>Zosterops chloris</i>	Kacamata, Pleci laut	20	0.667	4	0.112
<i>Zosterops montanus</i>	Kacamata gunung, Pleci gunung	25	0.847	5	0.140
<i>Zosterops palpebrosa</i>	Kacamata, Pleci biasa	103	3.491	35	0.987
Total of individual number		2,950		3,558	

Note: *) Protected bird based on the Minister of Environment and Forestry of Republic of Indonesia, No. P.92/Menlhk/Set.jen/Kum.1/2018; **) Imported bird. TS Threatened species based on The IUCN Red List. Ap I Appendix I of CITES (Convention on International Trade in Endangered Species of Fauna and Flora), species are totally prohibited to trade. Ap II Appendix II of CITES (Convention on International Trade in Endangered Species of Fauna and Flora), species are allowed to be traded, if management authority in the exporting country issues an export permit

Table 7. Bird population recorded in bird market of Sukahaji, Bandung and bird market of Splendid, Malang (2015).

Location	Species number	Individual number	Dominant species	Sub-dominant species	Non-dominant species
Bird market of Sukahaji, Bandung	128	2,950	3	11	114
Bird market of Splendid, Malang	116	3,558	4	7	105
Total	160	6,508	7	8	219

Table 8. Dominant and sub-dominant of various bird species recorded in bird market of Sukahaji, Bandung and bird market of Splendid, Malang (2015).

Location	Dominant species (Ab= > 5 %)	Sub-dominant (Ab= 2-5 %)
Bird market of Sukahaji, Bandung	1. Bondol hijau- <i>Erythrura prasina</i> (11,762 %) 2. Kenari- <i>Serinus canarius</i> (7,966 %) 3. Merpati- <i>Columbia livia</i> (11,796 %)	1. Bondol- <i>Lonchura maja</i> (3.457) 2. Bondol hitam- <i>Lonchura ferruginosa</i> (3.389) 3. Gelatik Jawa- <i>Pada oryzivora</i> (2.035) 4. Jalak Batam- <i>Acridotheres tristis</i> (2.135) 5. Jalak Suren- <i>Strurnus contra</i> (3.627) 6. Kacamata- <i>Zosterops palpebrosa</i> (3.491) 7. Kutilang- <i>Pycnonotus aurigaster</i> (3.728) 8. Lovebird- <i>Agapornis</i> sp (3.423) 9. Perikutan- <i>Geopelia striata</i> (4.033) 10. Pipit- <i>Lonchura leucogastroides</i> (3.457) 11. Tikukur- <i>Streptopelia chinensis</i> (3.593)
Bird market of Splendid, Malang	1. Kenari- <i>Serinus canaries</i> (26.363) 2. Lovebird- <i>Agapornis</i> sp (7,897) 3. Prinjak padi- <i>Prinia inornata</i> (6.323) 4. Prit benggala- <i>Amandava amandava</i> (7.195)	1. Jogjog/Cerocokan- <i>Pycnonotus goiavier</i> (2.164) 2. Kutilang- <i>Pycnonotus aurigaster</i> (2.698) 3. Manyar- <i>Ploceus manyar</i> (3.709) 4. Merpat- <i>Columba livia</i> (4.047) 5. Parkit- <i>Melopsittacus undulates</i> (4.328) 6. Peking- <i>Lonchura functulata</i> (2.248) 7. Pipit- <i>Lonchura leucogastroides</i> (2.136)

Figure 6. Bird of perhutut (*Geopelia striata*) is one of predominant species traded in the bird market

Figure 7. Bird of jogjog (*Pycnonotus goier*) is predominantly traded in the market

Figure 8. Bird of bondol (*Lonchura maja*) is commonly traded in the bird market

Figure 9. Bird of kaca mata/pleci (*Zosterops palpebrosa*) is dominant species traded in bird the bird market

Regarding total species, bird species diversity recorded in bird market Sukahaji, Bandung and Splendid, Malang tended to high, but actually, only some species had a high population and rest of them owned low population (Table 7). For birds that owned low population, have not always occurred or recorded in the bird market over time. Sometimes those birds have not found in the bird market because of lack of supply from the rural areas. In addition, the composition of bird species in the bird market has frequently changed by many factors, including bird migratory season. For example, several migrant bird species, including alap-alap jambul (*Aviceda leuphotes*) and dedalik (*Glareola maldivarum*) were recorded in the Bandung bird market only in during the bird migratory season (Iskandar 1980). Similarly, several migratory bird species, including sikatan biru-putih (*Cyanoptila cyanomelana*), anis Siberia (*Zoothera sibirica*), and sikatan narsis (*Ficedula narsissina*) were recorded in the bird market of Splendid, Malang, during the bird migratory season (Prakosa and Kurniawan 2004).

Prices of bird

Based on the results of interviews with respondents in the bird market of Sukahaji, Bandung and the Splendid,

Malang, the price of birds recorded varies greatly. The price of a type of bird can be range from cheap prices to very expensive one. Some of the factors that influence bird prices, including bird species and bird conditions. In general, the species of birds that are known as songbirds have a higher price than that of the species of non-songbirds. Birds that are already tame and want to sing (*burung jadi*) have a higher price than birds that are still wild/not yet tame and don't want to sing (*burung garabagan*), even though the species is the same, the selling price can be cheaper. Birds are still young hunted from nature have a higher price than birds that have been adult and directly caught from the rural areas.

The species of birds that are usually contested have a higher price than common bird species which are not commonly contested in songbird contests. The contest winning birds also have higher prices, compared to the failing bird to be champions of songbird contests. In addition, rare and protected bird species have more expensive prices than common birds and are not protected by law. Considering rare bird species and protected by law, supply is lower than demand, and these species become high symbolic status for their keepers. Some species of birds that have high prices in the bird market of Sukahaji,

Bandung, and bird market of Splendid, Malang can be seen in Table 9.

It can be seen from Table 9 that some bird species having high prices are the species of birds that are usually contested, such as murai batu (*Copsychus malabaricus*), cucak rawa (*Pycnonotus zeylanica*), anis merah (*Zoothera citrina*), parket (*Melopsittacus undulatus*) and kenari (*Serinus canarius*). In addition, there are bird species that have very low population in the bird market, namely Eastern Indonesia birds, including nuri (*Eclerus roratus*) and Indonesian protected birds, including Jalak Putih Bali (*Leucopsar rothschildi*). In the meantime, in the bird market of Pramuka, Jakarta some species of birds have high prices, including pleci/burung kaca mata (*Zosterops palpebrosa*), jalak kerbau (*Acridotheres javanicus*), beo (*Gracula religiosa*), murai batu (*Copsychus malabaricus*), and hwamei (*Garrulax conorus*), which are also commonly species of bird that are popularly kept in the cages and predominantly contested in urban (Chng et al. 2015).

Positive and negative impact of the life bird trading

Trading bird in the bird markets in the urban has been giving positive and negative impacts. The positive impacts of bird trade on the bird market in the urban have occurred, including economic benefits for bird traders in different levels, including village bird hunters, village middlemen, bird traders in the sub-district urban, and bird traders at the bird market of an urban district or capital of province. With it has been popular of the bird trade in the bird market in the urban areas; they have also developed various people's economic activities. These include the development of the people's economy in supporting bird trading, namely the

development of sales of bird feed, such as crickets, grasshoppers, caterpillars, red ant eggs (*kroto*), banana of variety *kepok*, and artificial feed (pellets), medicines, and vitamins, cages, and bird nest boxes (Figures 10-15).

Because the demand for birds has increased in urban areas, the bird markets develop in many cities of Indonesia. Moreover, by availability of a lot of various birds traded in the bird markets that have been mainly supplied by both rural bird traders and middlemen, the urban people who love keeping birds can easily be bought birds in the bird markets instead of bird catching by themselves from rural areas. Meanwhile, the negative effects of bird trade, including due to hunting of birds in many rural areas without control, to be traded in bird markets can cause scarcity of bird species in nature of rural areas (Endri 2014; Iskandar 2017). Therefore, with the popular bird trade in the urban, many species of birds in the rural ecosystem have been intensively hunted by villagers, sold to middlemen in the village (Figures 14-15).

Moreover, the village birds are brought to the district bird market or the provincial bird market (Iskandar et al. 2016). The price of birds that were previously cheap in the village, the price of the city in the city has increased (Endri 2014). Thus, the population of various types of birds in nature has decreased, due to various factors, such as habitat destruction, pesticide poisoning, poaching to be killed, and also due to hunting for live bird trade in bird markets in the city (Iskandar 1980; Shannaz et al. 1995; Iswantoro 2008; Supriyadi et al. 2008; Purnama and Indarawan 2011; Pangau-Adam and Noske 2011; Iskandar 2014; Saefullah et al. 2015; Aryanto et al. 2016; Iskandar and Iskandar 2015; Iskandar and Iskandar 2016).

Table 9. Some bird species that have high price in bird market of Sukahaji, Bandung and bird market of Splendid, Malang (2015)

Location	Species	Family	Local name	Price (Rupiah)
Bird market of Sukahaji, Bandung	<i>Cacatua galerita</i> *	Cacatuidae	Kakatua putih jambul kuning	1,500,000-2,500,000
	<i>Copsychus malabaricus</i>	Turdidae	Murai batu, Larwo	100,000-6,000,000
	<i>Eos</i> sp.	Psittacidae	Nuri	1,000,000-2,000,000
	<i>Gracula religiosa</i> *	Sturnidae	Beo	100,000-2,000,000
	<i>Leucopsar rothschildi</i> *	Sturnidae	Jalak putih Bali	100,000-2,000,000
	<i>Melopsittacus undulatus</i> **	Psittacidae	Parkit	100,000-1,000,000
	<i>Pycnonotus zeylanicus</i>	Pycnonotidae	Cucakrawa	
	<i>Serinus canarius</i> **	Fringillidae	Kenari	500,000-3,000,000
	<i>Serinus atrogularis</i> **	Fringillidae	Black throat	100,000-1,500,000
	<i>Zoothera citrina</i>	Turdidae	Anis merah	100,000-2,000,000
				50,000-2,500,000
Bird market of Splendid, Malang	<i>Copsycus malabaricus</i>	Turdidae	Murai batu, Larwo	500,000-5,000,000
	<i>Gracula religiosa</i> *	Sturnidae	Beo	500,000-850,000
	<i>Leucopsar rothschildi</i> *	Sturnidae	Jalak putih Bali	3,000,000-3,500,000
	<i>Melopsittacus undulatus</i> **	Psittacidae	Parkit	150,000-2,000,000
	<i>Pycnonotus zeylanicus</i>	Pycnonotidae	Cucak rawa	
	<i>Serinus canarius</i> **	Fringillidae	Kenari	3,000,000-5,000,000
	<i>Serinus atrogularis</i> **	Fringillidae	Black throat	170,000-10,000,000
	<i>Zoothera citrina</i>	Turdidae	Anis merah	1,150,000-1,750,000
				650,000-1,300,000

Note: Price of bird purchase in the period between 2013 and 2015, and 1 US \$= Rp 12,250 in 2013; 1 US\$ =Rp 13,802 in 2015. *) Protected birds based on Indonesian law of the government regulation of the Minister of Environment and Forestry on 2018 (No.106/MENLHK/SETJEN/KUM.1/12/2018). **) Originally imported birds

Figure 10. Caterpillars are commonly traded in the bird market as food of birds

Figure 11. Banana of variety *kepok* or *pisang kapok* is predominantly traded in the market as food of birds

Figure 12. Various bird cages are commonly traded in the market

Figure 13. Nest boxes are predominantly traded in the market to use for captive breeding of birds

Figure 14. A village man is preparing of sap of *Artocarpus elasticus* on a branch tree to catch birds in the upper Citarum village, West Java, Indonesia

Figure 15. Caught birds from the forest are being put in the cages of one of the village bird hinderers, before sending to middle man (*bakul*) and sending to bird sellers in urban bird market.

Therefore, to support bird trade in bird markets in Indonesian urban areas in a sustainable system, in addition to relying on the capture of birds in the rural areas, some efforts to captive breed birds, especially for rare bird species must be more promoted. At the present time, some breeding efforts have begun to be practiced in the urban people, and some of them have succeeded (Fauzi 2012; Ma'rufi 2018). In addition, some bird contests should be more properly managed, which are only allowed for captive birds, and need ongoing supervision from the authorities.

It can be concluded that from a survey of 60 bird traders in the bird market of Sukahaji, Bandung and Splendid, Malang, a total of 162 bird species, representing 38 families were documented. Among them, 10 species representing 7 families recorded as protected bird by law in Indonesia. The total bird population, in Sukahaji has recorded 2,950 individuals; while in Splendid were recorded 3,558 individuals. Prices of birds that are traded varied greatly depending on the species and characteristics of birds. It has also been revealed that bird trade in the bird market has been various economic benefits for many people. However, due to the bird trade in bird markets in the city, which has not been properly managed, the sustainability system of the bird trade in the city is very alarming caused of many factors, including decreasing of bird population over time in rural ecosystem as main supply of urban bird trading in the bird markets. For example, today undoubtedly population of some local birds, including cucak rawa (*Pycnonotus zeylanicus*), anis merah (*Zoothera citrina*), and murai batu (*Copsychus saularis*) have dramatically decreased in some rural areas of Indonesia, because of intensive hunting for commercial trading in bird markets and contesting of the songbird contest in the urban. Therefore, bird trading in the bird markets must be properly managed based on the sustainable development program concept, namely pro-economic, pro-social, and pro-environment.

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