

CHARACTERISTICS AND EXPERIENCES OF BIRDWATCHER IN INDONESIA

INSAN KURNIA^{1*)}, HARNIOS ARIEF²⁾, ANI MARDIASTUTI²⁾ AND RACHMAD HERMAWAN²⁾

¹⁾ Study Program of Ecotourism, College of Vocational Studies, IPB University, Bogor, 16128, Indonesia

²⁾ Department of Forest Resources Conservation and Ecotourism, Faculty of Forestry and Environmental, IPB University, Bogor, 16680, Indonesia

*Email: insankurnia@apps.ipb.ac.id

Accepted March 04, 2023 / Approved April 09, 2023

ABSTRACT

Birdwatching is one of nature recreations focusing on enjoying the wild birds. This activity is a hobby that continuously develops and has high economical value, besides beneficial related to conservation. A study of birdwatching in Indonesia is only focused on a bird potential supply concept in various locations without any demand study. A demand study is expected to become the basic of birdwatching management following the birdwatcher desire. This study aimed to analyze the birdwatcher characteristics in Indonesia on demographical and experience aspects. The study was performed on February to April, 2020 using online questionnaire distributed to Indonesian birdwatchers. The respondents who completely filled the questionnaire were 1257 birdwatchers. The respondent demographic is dominated by male, adolescent and early adult, living in the city, high educational background, private employe, and conservation organization member. The birdwatching experience is dominated by less than 3 hours activity. The protected area becomes the most-visited location by birdwatchers followed by the urban landscape. Bird identification is mostly carried out through visuals rather than through sounds. The most commonly used equipment is the bird fieldguide and binoculars.

Key words: *birdwatcher; birdwatching, characteristics, demographic, experience*

INTRODUCTION

Birdwatching or also called as avitourism is a bird observational recreation type in a wild nature by naked eyes with telescope and binoculars, or only listening the bird sounds. Birdwatching is part of nature tourism focused on the bird observation (Biggs et al., 2011) to be enjoyed through watching or listening (Belaire et al., 2015). This recreational activity is carried out in a very varied way from bird observation, discovery listing, until new species discovery competition; therefore, the experts specifically distinguish birdwatching or birding and twitching (Schaffner, 2009) to create a birdwatcher specialization (McFarlane, 1994; Hvenegaard, 2002). Nowadays, birdwatching is part of ecotourism activities that rapidly develops in economic sector (Cordell dan Herbert 2002; Sekercioglu, 2002; Nicolaidis 2014; Szczepańska *et al.* 2014; Callaghan et al., 2017; Schwoerer & Dawson, 2022). Birdwatching is closely related to environment, conservation, and biodiversity. Birdwatchers are known to care more about the environment and conservation (Biggs et al., 2011; Steven et al., 2013; Cooper et al., 2015; Cheung et al., 2017; Ocampo-Peñuela dan Winton 2017; White et al., 2018; Liu et al., 2021; Ren et al., 2022).

Since being introduced more than one hundred years ago, birdwatching is a popular activity and continuously increases its popularity in many countries, especially the developed countries (Sekercioglu, 2002; Ma et al., 2018). Birdwatcher in Indonesia is reported to emerge, marked by the existence of bird observational community and birdwatching tourism business, as more than 1958 bird species (Mittermeier et al., 1997;

Sukmantoro et al., 2007). The diversity of this bird species can become an asset for tourism establishment with birds as a flag species (Veríssimo et al., 2009; Garnett et al., 2018).

Generally, there are no studies in Indonesia describing the birdwatchers; therefore there are imbalances between resource offer in the form of birds and demand. The study performed was only limited to the birdwatching potential studies in one area based on the bird species diversity, namely, performed in natural landscape (e.g., Ardiansyah et al., 2019; Asrianny et al., 2018), rural landscape (e.g., Afif et al., 2018; Kurniawan et al., 2017), and urban landscape (Janra, 2019). Therefore, it is very important to perform a study about the birdwatcher demand in Indonesia, thereby obtained a description about the requirement and eagerness from birdwatchers (Vas, 2017; Eubanks et al., 2004). Globally, there are still minimum studies about the birdwatching demand (Steven, 2015), including Indonesia. A comprehension about birdwatchers will be the basic of birdwatching management, therefore this recreation can continuously develop with the right target following the recreation actor eagerness (Costa et al., 2018; Ma et al., 2018). This study aimed to analyze the birdwatcher characteristics in Indonesia based on the demographical and experience aspects.

RESEARCH METHOD

The study was performed on February-April, 2020. The data comprised demographic and experience taken using an online questionnaire instrument (*google form*). The respondent criteria were Indonesian people that once

carried out a birdwatching in any locations around Indonesia. The respondents were obtained (1) directly known as birdwatchers, and (2) scientific publication, popular publication, birdwatcher community, environmentalist community or student organization. Questionnaires were distributed to 2,000 respondents via email, WhatsApp and other social media. A total of 1314 respondents returned the questionnaire and only 1257 respondents filled out the questionnaire completely.

A close-ended questionnaire with various choices of possible answer. The likert scale used was 1 (never), 2 (endangeredly), 3 (often), and 4 (always). Each question had one answer choice. An opened answer was only about a birdwatching location experience. The socio-demographical data containing gender, age group, hometown, educational background, job, and conservation organization membership. The data were analyzed using a generalized linear model (GLZ). The independent variables in GLZ were binary between yes and no as a response on the questions. These aspects were analyzed against the independent variables by demographic to determine the significantly influenced factors. A significant value level used was 5% ($p < 0.05$). The data processing used an IBM SPSS 24.0 version.

RESULT AND DISCUSSION

1. Respondent Demographic

The number of birdwatchers that responded the distributed questionnaire were 1,314 people, but only 1,257 (95.7%) who fully or nearly completed the answers. The respondents were distributed in 232 of 514 city and regency and 33 of 34 provinces in Indonesia (**Figure 1**). The average respondent age was 30.4 ± 9.2 years old. The male respondent was commonly older, i.e 31.7 ± 9.3 years old, than the female respondent (26.9 ± 7.9 years old).

Respondent demographics show that birdwatching can be done by all groups of people with various backgrounds. Birdwatching is not an exclusive activity only for certain groups and classes. The gender background shows that birdwatching can be done by both male and female respondents. Likewise, other demographic factors, namely age, domicile, educational background, type of work, and membership in conservation organizations indicate that birdwatchers come from various backgrounds, although there are differences in the proportions of each category.

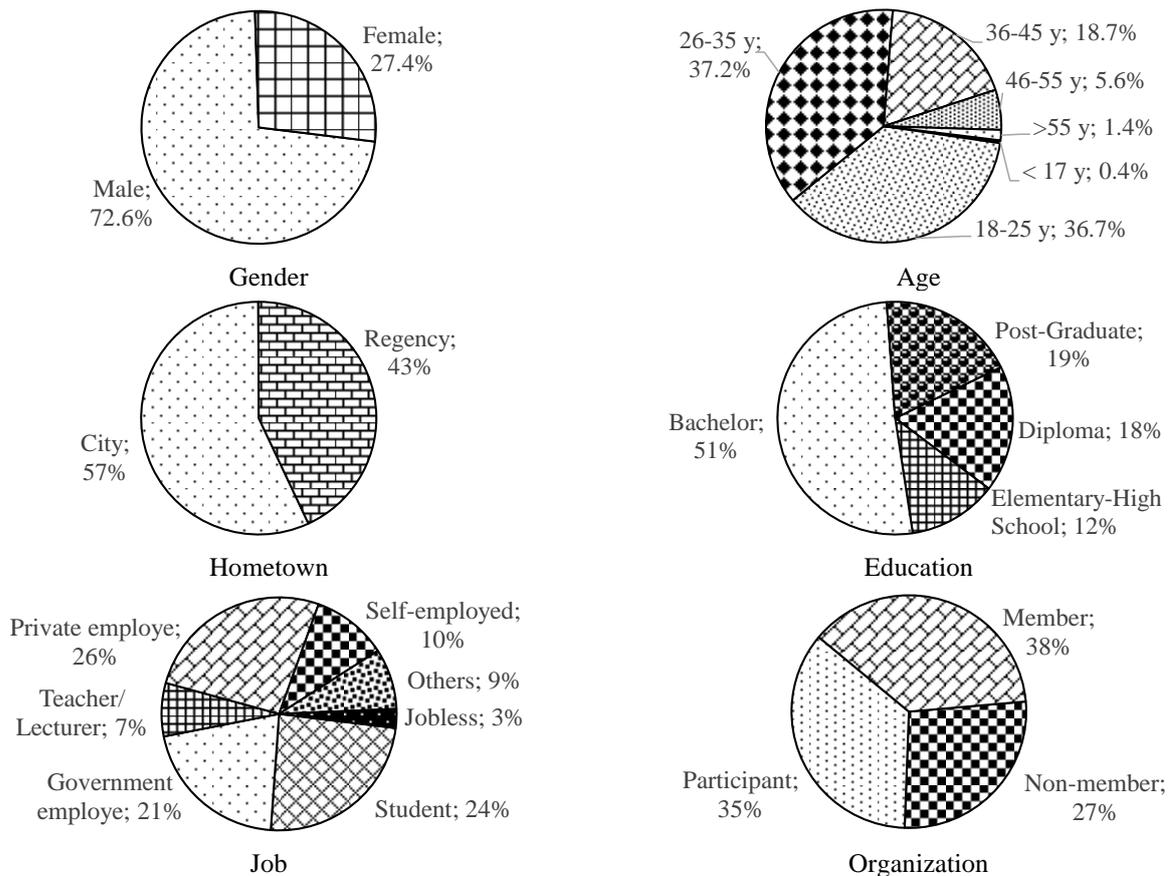


Figure 1. Respondent Demographic (n=1257)

The dominance of male respondents compared to female respondents followed Nicolene Conradie (2015) in British and Dutch Birdwatching Fair participation. Different results were found by Frątczak et al. (2020); Omar et al. (2019); Costa et al. (2018), and Maple et al. (2010) who found that more female respondents became the birdwatchers. Nevertheless, Eubanks et al. (2004) found that there was an insignificant difference between birdwatcher genders, which can be said that birdwatching is a gender-equal activity. A slightly different result by Cooper & Smith (2010) stated that birdwatching for competitive activity category was dominated by male, while more casual birdwatching was dominated by female. Lee et al. (2015) explained that male birdwatchers may demonstrate their skills, while female birdwatchers consider birdwatching as a personal development, pleasure, satisfaction, and recreation. Comparison with birdwatchers in other countries, birdwatching in Indonesia has more to do with competitive and adventurous activities because there are more male birdwatchers.

The dominant respondent groups were adolescents and early adults. This was different from Costa et al. (2018) who found the late adult group (> 35 years) to dominantly become the birdwatchers, as also presented from Conradie (2015), Green & Jones (2010), Maple et al. (2010), and Eubanks et al. (2004). This difference possibly occurred as birdwatching in Indonesia is considered a challenging activity that can only be carried out by the younger age group. This was on the contrary of birdwatchers in the developed countries, which are from the retirement age group (Eubanks et al., 2004), as 30% birdwatchers in the USA are > 55 years old (Carver, 2013).

The respondent hometown that mostly live in city area compared to regency indicates that the natural connection is desired by the community. The city landscape is characterized by the domination of socio-cultural components (Andersson, 2006; Pickett et al.,

2001) with identical physical form as a result of the extreme natural ecosystem change in a certain period, causing the natural form changes (Silva et al., 2015). The city inhabitant trend gradually increases either in the world (UN, 2018) or Indonesia (BPS, 2022), thereby the total city inhabitant is higher than village. Similar results were found in Poland (Janeczko et al., 2021) that most birdwatchers live in big cities.

The respondent educational background indicates that birdwatchers are commonly the tourist groups with high educational background (Omar et al., 2019; Costa et al., 2018, Cheung et al., 2017; Eubanks et al., 2004; Sekercioglu, 2002). This condition was also found in Costa et al. (2018) that birdwatchers were dominated by high educational background groups. Birdwatching is an activity that combines recreation and scientific activities (Kordowska & Kulczyk, 2014), therefore attracts many educated people.

2. Activeness in Birdwatching Activity

Respondents who initially carried out birdwatching was in 1979 (n=1), while 24 respondents initially started watching in 2020. The most respondents who initially carried out a birdwatching was in 2018 (n=138) (Figure 2). The respondent majority was active birdwatcher in a year (April 2019-March 2020) (67%, n=842) with more than seven time watching frequency in a year (47%). The average age that initially carried out birdwatching was 21.7 ± 6.8 years old. The male respondent was generally older when initially carried out birdwatching at 22.5 ± 7.2 years old than female respondent at 19.7 ± 5.0 years old.

The number of birdwatchers according to their expertise differed significantly based on the time length experienced in birdwatching ($\chi^2 = 150.87$; $df = 12$; $P < 0,01$). However, time length experience only had small correlation with the level of birdwatcher's skill ($r = 0.45$, $P = 0.000$). Long experience time does not make the birdwatcher claim to be an expert birdwatcher (Table 1).

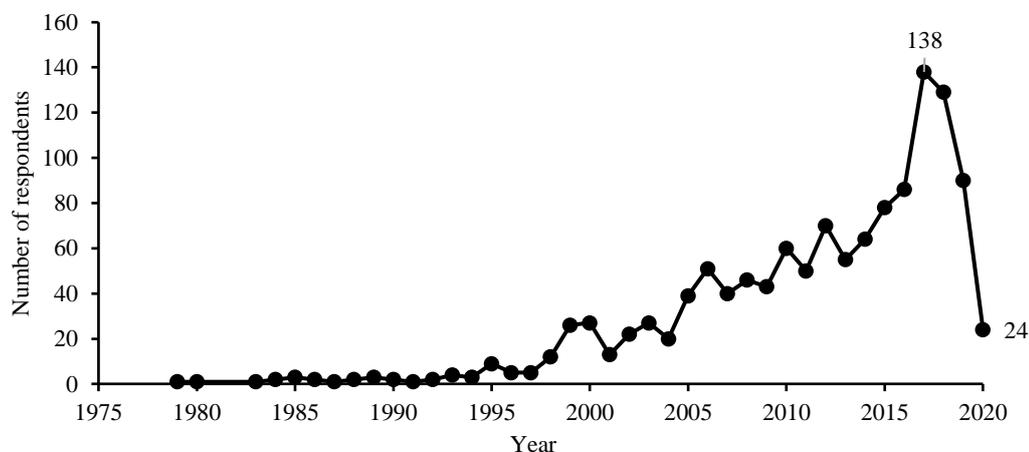


Figure 2. The number of respondents based on the year when initially carried out (n=1257)

The birdwatcher experience indicates that birdwatching has long been appeared in Indonesia as a recreational activity to utilize birds. The emergence of Indonesian ornithologists in the last four decades (Somadikarta, 2005), has become part of the emergence of the birdwatcher generation in Indonesia. The birdwatcher regeneration also presents the existence of beginner birdwatchers appeared annually along with the increased number of adolescent birdwatchers during the first-time birdwatching. This condition indicates that birdwatching is predicted to continuously develop as the community preferred hobby. This followed the statement of Cordell & Herbert (2002) and Sekercioglu (2002), that birdwatching is gradually developing hobby, not even just referred to as a hobby, but birdwatching will become a lifestyle in the future (Janeczko et al., 2021).

In the beginning, birdwatching activities were only carried out by the experts, namely ornithologists, however, nowadays this activity has not only been monopolized by professional birdwatchers alone, but has developed into activities carried out by non-bird experts as well. This is indicated by several studies that have found beginner birdwatchers, thus indicating that the birdwatchers are not ornithologists (Maple et al., 2010; Scott et al., 2005; Scott & Thigpen, 2003; Hvenegaard, 2002).

3. Birdwatching Experience Duration

The birdwatcher experience was dominated by activity duration of less than three hours (n=892). Only

two demographical factors that affected significantly in period duration experience, namely job and conservation organization membership (Table 2).

The high experience of respondents in birdwatching activities with a duration of < 3 hours indicates that birdwatching does not always have to be done for a long period of time, but can also be performed in a short periode of time. Only specific respondents that are expertise to perform birdwatching in a long period of time (Hvenegaard, 2002; McFarlane, 1994). Costa et al. (2018) also found that the birdwatching activity was dominated by 1-7 days duration.

The significant value of organizational variable in all birdwatcher experience aspects either period duration or location experiences, indicates that the organization role is important to encourage its members to perform birdwatching with various activities. Organization members generally have a higher preference in birdwatching (Eubanks et al., 2004). Similar results were also found in Costa et al. (2018) that most birdwatchers were the members of nature conservation organizations. Female became the demographical factor that significantly influenced the birdwatching location experience in the house garden or housing complex indicates that female more preferably chooses a location near the residence than male. Male tends to choose location further for birdwatching. This result was similar to Sali et al. (2008) that male tended to go further than female.

Table 1. Comparison of the length of the birdwatcher's experience with birdwatcher's categories.

Num.	Long experience	Birdwatcher's categories		
		Beginner	Intermediate	Expert
1	First year	114	0	0
2	2-3 years	210	57	0
3	3-5 years	103	42	19
4	5-10 years	131	75	33
5	> 10 years	260	116	97
Total (%)		818 (65.08)	290 (23.07)	149 (11.85)

Table 2. The GLZ analysis of birdwatcher demographic aspect and birdwatching experience duration.

Dependent Variable	Significant Effect	P value	χ^2 (df)	Odds
< 3 hours (n=978)	Organization	0.002	21.9 ^b (6)	Membership > Non-member
½ Day (n=844)	Job	0.005	36.1 ^a (21)	Private Company Worker > Others
	Organization	0.000	54.7 ^b (6)	Membership > Non-member
1 Day (n=768)	Job	0.006	66.0 ^b (21)	Private Company Worker > Others
	Organization	0.000	70.6 ^b (6)	Membership > Non-member
2 Days (n=679)	Organization	0.000	44.8 ^b (6)	Membership > Non-member
3-6 Days (n=740)	Organization	0.001	31.5 ^a (6)	Membership > Non-member
7-18 Days (n=645)	Organization	0.017	24.2 ^b (6)	Membership > Non-member
19-54 Days (n=610)	Job	0.014	51.0 ^b (21)	Private Company Worker > Others
	Organization	0.023	15.1 ^a (6)	Membership > Non-member
> 54 Days (n=604)	-	-	-	-

Note: ^a the level of significant P< 0.05; ^b the level of significant P< 0.01

The hometown demographic factor which had a significant effect in the location experience shows that respondents who live in the districts tend to choose locations that are associated with natural landscapes, namely, protected areas, national parks, rivers, etc. This is thought to be related to the ease of location access. It is predicted that respondents who live in the districts is easier to access these locations than respondents who live in the urban area. Zhang & Huang (2020) stated that accessibility is one of the keys to make a location become the birdwatching destination in the urban park.

The job demographic factor also influenced in almost all period duration and location experiences for birdwatching. The private and freelance jobs had a

significantly higher tendency in all choices than non-private jobs. The leisure availability is a factor that encourages respondents to have longer time to do birdwatching. The concept of leisure is the basis for all recreational activities in general (Veal, 1992).

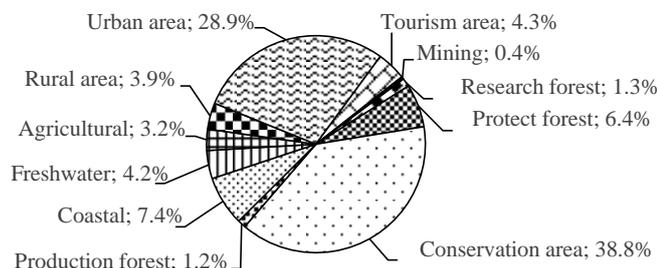
4. Birdwatching Experience Location

Overall, the respondents are more experience in birdwatching at a rural and urban landscape (98%, n=1231) than at a natural landscape (96%, n=1206) (Table 3). There are 11 groups from total 4376 location based on the birdwatcher experience in birdwatching (Figure 3).

Table 3. The GLZ analysis of birdwatcher demographic aspect and birdwatching experience location

Dependent Variable	Significant Effect	P value	χ^2 (df)	Odds
Others protected area (n=957)	Hometown	0.037	24.2 ^b (6)	Regency > City
	Job	0.040	38.5 ^b (21)	Private Company Worker > Others
	Organization	0.000	32.4 ^b (6)	Member > non-member
National park (n=937)	Hometown	0.000	27.1 ^b (6)	Regency > City
	Organization	0.009	18.0 ^b (6)	Member > non-member
Yard (n=802)	Gender	0.003	14.6 ^b (3)	Female > male
	Job	0.011	53.1 ^b (21)	Private Company Worker > Others
	Organization	0.009	54.4 ^b (6)	Member > non-member
Farmand (n=770)	Organization	0.000	58.2 ^b (6)	Member > non-member
River (n=779)	Hometown	0.004	27.0 ^b (6)	Regency > City
	Organization	0.000	52.9 ^b (6)	Member > non-member
City parks and forest (n=782)	Job	0.007	49.1 ^b (21)	Private Company Worker > Others
	Organization	0.000	42.5 ^b (6)	Member > non-member
Beach (n=751)	Education	0.041	42.4 ^b (9)	High > low
	Organization	0.000	68.8 ^b (6)	Member > non-member
Lake / pond (n=719)	Job	0.007	35.5 ^a (21)	Private Company Worker > Others
	Organization	0.001	46.3 ^b (6)	Member > non-member
Hosuing (n=668)	Gender	0.042	5.4 (3)	Female > male
	Job	0.003	60.1 ^b (21)	Private Company Worker > Others
	Organization	0.000	32.6 ^b (6)	Member > non-member

Note: ^a the level of significant P< 0.05; ^b the level of significant P< 0.01



(a)

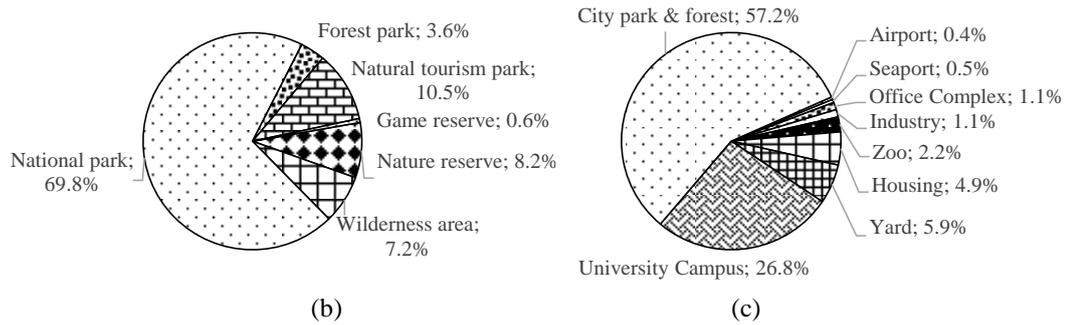


Figure 3. Percentage of birdwatcher experience according birdwatching location (a) general location, (b) conservation area, (c) habitat type in urban lansdcape.

High birdwatcher experience to perform birdwatching in the protected area including national part is predicted as in fact, Indonesia has many protected areas. Nowadays, there are 556 conservation areas, including 54 national parks in Indonesia (KLHK, 2018). The satisfaction in the national park becomes the attractive component that commonly occurs in one destination (Said & Maryono, 2018).

Apart from the protected areas, the birdwatching experience in urban landscapes is also quite high. This is supported by the fact that urban landscape with various habitat forms are still inhabited by birds (i.e. Tu et al., 2020; Kaban et al., 2018) and closed to the human inhabitation environment, therefore closer and easier to reach for birdwatching. The community has a positive view of birds in their vicinity (Belaire et al., 2015; Clucas et al., 2015), therefore thought to support the high birdwatching activity in urban landscapes. Humans need the closest ecosystem to fulfill the natural recreation, i.e urban parks, for leisure activities and other natural recreational activities, although they can also visit remote locations, i.e national parks (Vallecillo et al., 2019).

5. Birdwatching Experience Source of Information and Activity Type

The most information source is received from friends ($\bar{x} = 2.99$). The same condition was also found in a group form that the most birdwatching experience was carried out with friends ($\bar{x} = 3.13$) (Figure 4).

The dominance of birdwatching experience with friends indicates that togetherness and interaction with friends becomes the factor influencing the birdwatcher, not only focusing in birds. The choice of birdwatching activity with friends is in accordance with what was found by Scott et al. (1999) that spending time with friends is the motivation for birdwatching. Birdwatching is seen as an effort to maintain friendships. This is different from the intermediate and expert birdwatchers who focus more on birdwatching. The highest motivation for birdwatching found by McFarlane (1994) is related to

being with other birdwatchers and interacting with people who have the same interests. The form of birdwatching conducted alone is generally done by a expert birdwatcher.

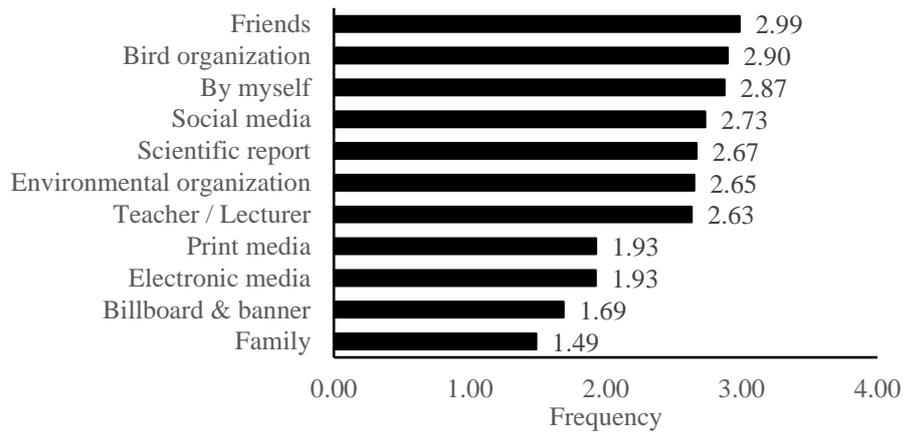
6. Bird Identification Technique and Equipment

Binoculars are the mostly-used equipments (84%, n=1,061) (Figure 5). The bird identification technique was more frequently performed visually than through sounds. Moreover, the use of bird fieldguide was more dominant than without using a bird filedguide (Figure 6).

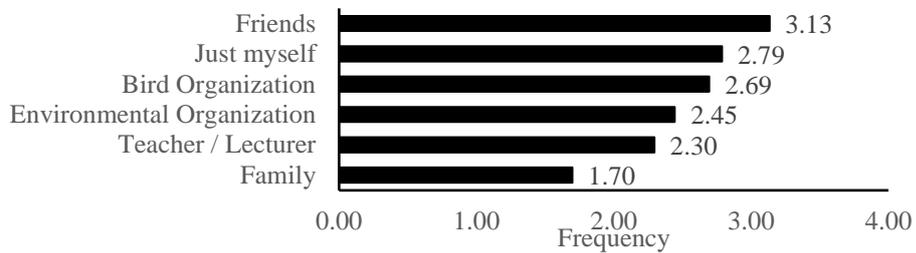
The capability of identifying birds without book assistance is mainly performed by the expert birdwatcher due to more understanding many bird species (Moore et al., 2008). This condition was also based on the common birdwatcher characteristics as an educated group and had more knowledge about the ecology (Cordell & Herbert, 2002). Therefore, their birdwatcher's knowledge of birds is generally better than that of the general public.

The use of bird fieldguide is also used for birdwatching as supporting equipment to identify birds (Steven, 2015). Binoculars are the main equipment to observe the bird from far to be easily watched (Steven 2015). This condition was similar to (Carver, 2013), who stated that the great funding spent for birdwatchers was for fulfilling the special equipment requirement, include binoculars.

The high DLSR camera user shows that birdwatchers have a strong motivation to take photos of birds (Glowinski, 2008). The concept of the relationship between motivation and equipment quality was first examined by (Bryan, 1977) in the relationship between fishermens motivation and fishing equipment. This concept has also been used in the general recreation concept by Kuentzel dan Heberlein (2006) or special recreation through birdwatching by Cheung et al. (2017); Scott et al. (2005); Scott & Thigpen (2003). The motivation is presented from the owned equipments, as the higher motivation, the better equipments quality.



(a)



(b)

Figure 4. The source of information for birdwatching location (a) and the group form in birdwatching activity type (b).

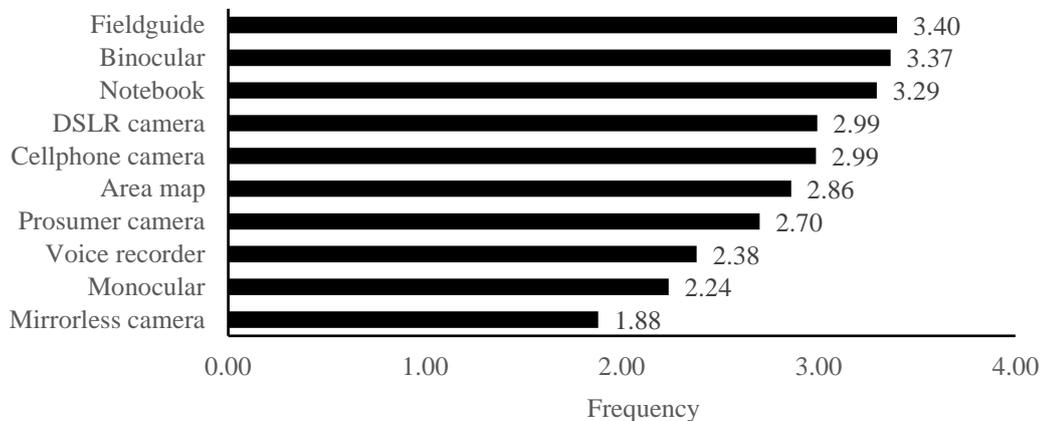


Figure 5. Total of respondents based on birdwatching tools used

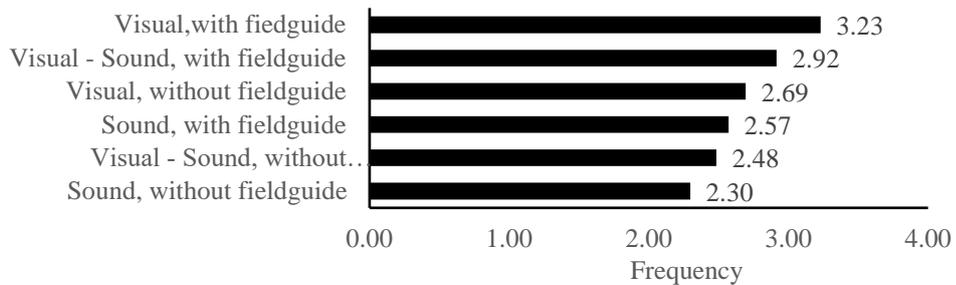


Figure 6. Bird identification technique of birdwatching activity

The characteristics and experiences of birdwatchers show that birdwatching in Indonesia has been going on for a relatively long time and is carried out by various groups of people from various backgrounds. Birdwatchers is also spread throughout Indonesia, both domiciled in cities and regency. Birdwatching can be done in various situations, namely short or long periods of time. Birdwatching has been carried out in various locations both in natural landscapes and urban landscapes, both protected and non-protected areas, as well as various types of habitats. Every birdwatcher has different preferences for different forms of activity and experiences with different sources of information. Various equipment is used according to the needs and abilities of each birdwatcher.

CONCLUSION

The demographics of Indonesian birdwatchers are dominated by men, adolescents and adult, live in cities, have high education, sector employees, and are members of conservation organizations. Birdwatcher experience shows that short duration of birdwatching is done more than long duration. Protected areas are the location for most observations, including national parks. Birdwatching with friends is the most commonly conducted birdwatching type. Likewise, friends are the source of the most birdwatching location information. The majority of birdwatchers identify birds visually with the help of binoculars and field guides.

ACKNOWLEDGMENTS

We would like to thank birdwatchers Indonesia as a respondent this research. This study did not receive any grants.

REFERENCES

- Afif, F., Aisyianita, R. A., & Saptin, D. S. (2018). Potensi birdwatching sebagai salah satu daya tarik wisata di Desa Wisata Jatimulyo, Kecamatan Girimulyo, Kabupaten Kulon Progo. *Jurnal Media Wisata*, 16(2), 1007–1015.
- Andersson, E. (2006). Synthesis, part of a Special Feature on Urban Sprawl Urban Landscapes and Sustainable Cities. *Ecology and Society*, 11(1). <http://www.ecologyandsociety.org/vol11/iss1/art34/>
- Ardiansyah, I. N., Matovani, R. T., Pertiwi, D. A., Salsabila, G., & Aryanti, N. A. (2019). Birdwatching Potential Based on Distribution of Bird Diversity in Protected Forests RPH Sumbermanjing Kulon KPH Malang. *Media Konservasi*, 24(2), 200–206. <https://doi.org/10.29244/medkon.24.2.200-206>
- Asrianny, A., Saputra, H., & Achmad, A. (2018). Identifikasi keanekaragaman dan sebaran jenis burung untuk pengembangan ekowisata bird watching di Taman Nasional Bantimurung Bulusaraung. *Perennial*, 14(1), 17. <https://doi.org/10.24259/perennial.v14i1.4999>
- Belaire, J. A., Westphal, L. M., Whelan, C. J., & Minor, E. S. (2015). Urban residents' perceptions of birds in the neighborhood: Biodiversity, cultural ecosystem services, and disservices. *Condor*, 117(2), 192–202. <https://doi.org/10.1650/CONDOR-14-128.1>
- Biggs, D., Turpie, J., Fabricius, C., & Spenceley, A. (2011). The value of avitourism for conservation and job creation - An analysis from South Africa. *Conservation and Society*, 9(1), 80–90. <https://doi.org/10.4103/0972-4923.79198>
- BPS. (2022). *Persentase Penduduk Daerah Perkotaan menurut Provinsi, 2010-2035*. Badan Pusat Statistik.
- Bryan, H. (1977). Leisure value systems and recreational specialization: The case of trout fishermen. *Journal of Leisure Research*, 9, 174–187. <https://doi.org/10.1080/00222216.1977.11970328>
- Callaghan, C. T., Lyons, M. B., Martin, J. M., Major, R. E., & Kingsford, R. T. (2017). Assessing the reliability of avian biodiversity measures of urban greenspaces using eBird citizen science data. *Avian Conservation and Ecology*, 12(2), 12. <https://doi.org/10.5751/ACE-01104-120212>
- Carver, E. (2013). *Birding in the United States: A Demographic and Economic Analysis Addendum to the 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*. <https://www.fws.gov/southeast/pdf/report/birding-in-the-united-states-a-demographic-and-economic-analysis.pdf>
- Cheung, L. T. O., Lo, A. Y. H., & Fok, L. (2017). Recreational specialization and ecologically responsible behaviour of Chinese birdwatchers in Hong Kong. *Journal of Sustainable Tourism*, 25(6), 817–831. <https://doi.org/10.1080/09669582.2016.1251445>
- Clucas, B., Rabotyagov, S., & Marzluff, J. M. (2015). How much is that birdie in my backyard? A cross-continental economic valuation of native urban songbirds. *Urban Ecosystems*, 18(1), 251–266. <https://doi.org/10.1007/s11252-014-0392-x>
- Conradie, N. (2015). *Profiling the international avitourist: preferences of avitourists at the British and Dutch birdwatching fairs*. 4(1), 1–26.
- Cooper, C. B., & Smith, J. A. (2010). Gender patterns in bird-related recreation in the USA and UK. *Ecology and Society*, 15(4). <https://doi.org/10.5751/ES-03603-150404>
- Cooper, C., Larson, L., Dayer, A., Stedman, R., & Decker, D. (2015). Are wildlife recreationists conservationists? Linking hunting, birdwatching, and pro-environmental behavior. *Journal of Wildlife*

- Management*, 79(3), 446–457.
<https://doi.org/10.1002/jwmg.855>
- Cordell, H. K., & Herbert, N. G. (2002). The Popularity of Birding Still Growing. *Birding*, 54–61.
- Costa, A., Pintassilgo, P., Matias, A., Pinto, P., & Guimarães, M. H. (2018). Birdwatcher profile in the Ria Formosa Natural Park. *Tourism & Management Studies*, 14(1), 69–78.
<https://doi.org/10.18089/tms.2018.14106>
- Eubanks, J. L., Stoll, J. R., & Ditton, R. B. (2004). Understanding the diversity of eight birder sub-populations: Socio-demographic characteristics, motivations, expenditures and net benefits. *Journal of Ecotourism*, 3(3), 151–172.
<https://doi.org/10.1080/14664200508668430>
- Frączak, M., Sparks, T. H., Randler, C., & Tryjanowski, P. (2020). Circadian preferences of birdwatchers in Poland: Do “owls” prefer watching night birds, and “larks” prefer daytime ones? *PeerJ*, 8(3), 1–11.
<https://doi.org/10.7717/peerj.8673>
- Garnett, S. T., Ainsworth, G. B., & Zander, K. K. (2018). Are we choosing the right flagships? The bird species and traits australians find most attractive. *PLoS ONE*, 13(6), 1–17.
<https://doi.org/10.1371/journal.pone.0199253>
- Glowinski, S. L. (2008). Bird-watching, ekotourism, and economic development: A review of the evidence. *Applied Research in Economic Development*, 5(3), 65–77.
- Green, R. J., & Jones, D. N. (2010). *Practices, needs and attitudes of bird-watching tourists in Australia*.
- Hvenegaard, G. T. (2002). Birder specialization differences in conservation involvement, demographics, and motivations. *Human Dimensions of Wildlife*, 7(1), 21–36.
<https://doi.org/10.1080/108712002753574765>
- Janeczko, E., Łukowski, A., Bielinis, E., Woźnicka, M., Janeczko, K., & Korcz, N. (2021). “Not just a hobby, but a lifestyle”: Characteristics, preferences and self-perception of individuals with different levels of involvement in birdwatching. *PLoS ONE*, 16(7), 1–16.
<https://doi.org/10.1371/journal.pone.0255359>
- Janra, M. N. (2019). Birding Backyard: Birdwatching in Andalas University. *IOP Conference Series: Earth and Environmental Science*, 327(1).
<https://doi.org/10.1088/1755-1315/327/1/012025>
- Kaban, A., Mardiasuti, A., & Prasetyo, L. B. (2018). Landscape structure affects bird community in Bogor, West Java. *Jurnal Penelitian Kehutanan Wallacea*, 7(2), 109.
<https://doi.org/10.18330/jwallacea.2018.vol7iss2pp109-118>
- KLHK. (2018). Status Hutan dan Kehutanan Indonesia. In *Kementerian Lingkungan Hidup dan Kehutanan RI. Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia*.
- Kordowska, M., & Kulczyk, S. (2014). Conditions and prospects for the development of ornithological tourism in Poland. *Turyzm*, 24(2), 15–21.
<https://doi.org/10.2478/tour-2014-0012>
- Kuentzel, W. F., & Heberlein, T. A. (2006). From novice to expert? A panel study of specialization progression and change. *Journal of Leisure Research*, 38(4), 496–512.
<https://doi.org/10.1080/00222216.2006.11950089>
- Kurniawan, E., Harianto, S. P., & Rusita, R. (2017). Studi Wisata Pengamatan Burung (Birdwatching) Di Lahan Basah Desa Kibang Pacing Kecamatan Menggala Timur Kabupaten Tulang Bawang Provinsi Lampung. *Jurnal Sylva Lestari*, 5(1), 35.
<https://doi.org/10.23960/jsl1535-46>
- Lee, S., McMahan, K., & Scott, D. (2015). The Gendered Nature of Serious Birdwatching. *Human Dimensions of Wildlife*, 20(1), 47–64.
<https://doi.org/10.1080/10871209.2015.956375>
- Liu, T., Ma, L., Cheng, L., Hou, Y., & Wen, Y. (2021). Is ecological birdwatching tourism a more effective way to transform the value of ecosystem services?—a case study of birdwatching destinations in mingxi county, china. *International Journal of Environmental Research and Public Health*, 18(23), 1–17.
<https://doi.org/10.3390/ijerph182312424>
- Ma, A. T. H., Chow, A. S. Y., Cheung, L. T. O., Lee, K. M. Y., & Liu, S. (2018). Impacts of tourists’ sociodemographic characteristics on the travel motivation and satisfaction: The case of protected areas in South China. *Sustainability (Switzerland)*, 10(10), 1–21.
<https://doi.org/10.3390/su10103388>
- Maple, L. C., Eagles, P. F. J., & Rolfe, H. (2010). Birdwatchers’ specialisation characteristics and national park tourism planning. *Journal of Ecotourism*, 9(3), 219–238.
<https://doi.org/10.1080/14724040903370213>
- McFarlane, B. L. (1994). Specialization and Motivations of Birdwatchers. *Wildlife Society Bulletin*, 22(3), 361–370.
- Mittermeier, R., Mittermeier, C., & Gil, P. (1997). *Megadiversity: Earth’s Biologically Wealthiest Nations*. Cemex.
- Moore, R. L., Scott, D., & Moore, A. (2008). Gender-based differences in birdwatchers’ participation and commitment. *Human Dimensions of Wildlife*, 13(2), 89–101.
<https://doi.org/10.1080/10871200701882525>
- Nicolaides, A. (2014). Stakeholders, purposes and responsibilities: Avitourism in South Africa. *African Journal of Hospitality, Tourism and Leisure*, 3(32).
www.ajhtl.com/%5Cnwww.ajhtl.com
- Ocampo-Peñuela, N., & Winton, R. S. (2017). Economic and Conservation Potential of Bird-Watching Tourism in Postconflict Colombia. *Tropical*

- Conservation Science*, 10. <https://doi.org/10.1177/1940082917733862>
- Omar, K., Halim, M. A. S. A., Samsudin, H., Mohamad, Z., Ismail, I. R., & Zulkiffli, S. N. 'Atikah. (2019). Self-engagement in avitourism: A case of taman negara bird count (TNBC2017) Malaysia. *International Journal of Recent Technology and Engineering*, 7(6), 1526–1530.
- Pickett, S. T. A. T. A., Cadenasso, M. L. L., Grove, J. M. M., Nilon, C. H. H., Pouyat, R. V. V., Zipperer, W. C. C., & Costanza, R. (2001). 1. Pickett STATA, Cadenasso MLL, Grove JMM, Nilon CHH, Pouyat RV V, Zipperer WCC, et al. Urban Ecological Systems: Linking Terrestrial Ecological, Physical, and Socioeconomic Components of Metropolitan Areas. *Annu Rev Ecol Syst* [Internet]. 2001;(32):127–5. *Annual Review of Ecology and Systematics*, 32, 127–157. http://dx.doi.org/10.1007/978-0-387-73412-5_7
- Ren, J., Su, K., Zhou, Y., Hou, Y., & Wen, Y. (2022). Why return? Birdwatching tourists' revisit intentions based on structural equation modelling. *Sustainability (Switzerland)*, 14(21). <https://doi.org/10.3390/su142114632>
- Said, J., & Maryono, M. (2018). Motivation and Perception of Tourists as Push and Pull Factors to Visit National Park. *E3S Web of Conferences*, 31, 1–5. <https://doi.org/10.1051/e3sconf/20183108022>
- Sali, M. J., Kuehn, D. M., & Zhang, L. (2008). Motivations for male and female birdwatchers in New York State. *Human Dimensions of Wildlife*, 13(3), 187–200. <https://doi.org/10.1080/10871200801982795>
- Schaffner, S. (2009). Environmental sporting: Birding at superfund sites, landfills, and sewage ponds. *Journal of Sport and Social Issues*, 33(3), 206–229. <https://doi.org/10.1177/0193723509338862>
- Schwoerer, T., & Dawson, N. G. (2022). Small sight—Big might: Economic impact of bird tourism shows opportunities for rural communities and biodiversity conservation. *PLoS ONE*, 17(7 July), 1–18. <https://doi.org/10.1371/journal.pone.0268594>
- Scott, D., Baker, S. M., & Kim, C. (1999). Motivations and commitments among participants in the great texas birding classic. *Human Dimensions of Wildlife*, 4(1), 50–67. <https://doi.org/10.1080/10871209909359144>
- Scott, D., Ditton, R. B., Stoll, J. R., & Eubanks, T. L. (2005). Measuring specialization among birders: Utility of a Self-Classification measure. *Human Dimensions of Wildlife*, 10(1), 53–74. <https://doi.org/10.1080/10871200590904888>
- Scott, D., & Thigpen, J. (2003). Understanding the birder as tourist: Segmenting visitors to the texas hummer /bird celebration. *Human Dimensions of Wildlife*, 8(3), 199–218. <https://doi.org/10.1080/10871200304311>
- Sekercioglu, C. H. (2002). Impacts of birdwatching on human and avian communities. *Environmental Conservation*, 29(3), 282–289. <https://doi.org/10.1017/S0376892902000206>
- Silva, C. P., García, C. E., Estay, S. A., Barbosa, O., & Chapman, M. G. (2015). Bird richness and abundance in response to urban form in a Latin American City: Valdivia, Chile as a Case Study. *PLoS ONE*, 10(9), 1–16. <https://doi.org/10.1371/journal.pone.0138120>
- Somadikarta, S. (2005). Get ahead read! Tracing ornithological literature of the IndoAustralian Archipelago 1945-2005. In S. Soemodihardjo & S. D. Sastrapradja (Eds.), *Six decades of science and scientists in Indonesia* (pp. 227–316). Naturindo.
- Steven, R. (2015). *The Relationship Between Birders , Avitourism and Avian Conservation*. August, 137. <http://hdl.handle.net/10072/367611>
- Steven, R., Castley, J. G., & Buckley, R. (2013). Tourism revenue as a conservation tool for threatened birds in protected areas. *PLoS ONE*, 8(5), 1–8. <https://doi.org/10.1371/journal.pone.0062598>
- Sukmantoro, W., Irham, M., Novarino, W., Hasudungan, F., Neville, K., & Muchtar, M. (2007). *Daftar Burung Indonesia No. 2*. Indonesian Ornithologist's Union.
- Szczepańska, M., Krzyżaniak, M., Świerk, D., Walerzak, M., & Urbański, P. (2014). Birdwatching as a Potential Factor in the Development of Tourism and Recreation in the Region. *Barometr Regionalny*, 12(4).
- Tu, H. M., Fan, M. W., & Ko, J. C. J. (2020). Different habitat types affect bird richness and evenness. *Scientific Reports*, 10(1), 1–10. <https://doi.org/10.1038/s41598-020-58202-4>
- UN. (2018). *World Urbanization Prospects, the 2018 Revision*. Population Division, Department of Economic and Social Affairs, United Nations Secretariat. <https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf>
- Vallecillo, S., La Notte, A., Zulian, G., Ferrini, S., & Maes, J. (2019). Ecosystem services accounts: Valuing the actual flow of nature-based recreation from ecosystems to people. *Ecological Modelling*, 392(April 2018), 196–211. <https://doi.org/10.1016/j.ecolmodel.2018.09.023>
- Vas, K. (2017). Birding blogs as indicators of birdwatcher characteristics and trip preferences: Implications for birding destination planning and development. *Journal of Destination Marketing and Management*, 6(1), 33–45. <https://doi.org/10.1016/j.jdmm.2016.02.001>
- Veal, A. J. (1992). School of Leisure, Sport and Tourism Definitions of Leisure and Recreation. *Australian Journal of Leisure and Recreation*, 2(52), 44–48. http://funlibre.org/biblioteca2/docs_digitales/investigacion/definiciones_ocio_y_recreacion.pdf

- Veríssimo, D., Fraser, I., Groombridge, J., Bristol, R., & MacMillan, D. C. (2009). Birds as tourism flagship species: A case study of tropical islands. *Animal Conservation*, 12(6), 549–558. <https://doi.org/10.1111/j.1469-1795.2009.00282.x>
- White, R. L., Eberstein, K., & Scott, D. M. (2018). Birds in the playground: Evaluating the effectiveness of an urban environmental education project in enhancing school children's awareness, knowledge and attitudes towards local wildlife. *PLoS ONE*, 13(3), 1–23. <https://doi.org/10.1371/journal.pone.0193993>
- Zhang, Z., & Huang, G. (2020). How do urban parks provide bird habitats and birdwatching service? Evidence from Beijing, China. *Remote Sensing*, 12(19), 1–15. <https://doi.org/10.3390/rs12193166>