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Providing biodiversity information to support sustainable development of Sugihan wetlands, South Sumatra

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Providing biodiversity information to support sustainable development of Sugihan wetlands, South Sumatra

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ABSTRACT. Air Sugihan or Sugihan wetlands is a subdistrict in Ogan Komering Ilir district, South Sumatra province, Indonesia. The area covering is about 2.593 km², mostly dominated by wetlands, ranging from peatland to the mangrove zone. The Padang-Sugihan Wildlife Reserve is a Wildlife Sanctuary that borderly or within Air Sugihan wetlands. Before the area was set aside for a wetland reserve in April 1983 the area was being prepared for transmigrant settlers. Among other threatened wildlife, birds and fishes are two taxa that very fragile to human disturbances. Since November 2016, we explore basic biodiversity information of Sugihan wetlands, particularly focus on fish and bird diversity. A total of 33 species of fishes and 39 birds were recorded, suggest the wetlands in this area support important habitat of rich diversity. To collect information on bird diversity, three survey methods were applied (riverine survey, time point counts and incidental search). For collecting data of fishes, we collect specimens from local fishermen, with additional data collected by us using hand netting and fish trap netting. Long-term study was initiate to providing comprehensive biodiversity information to support sustainable development of Sugihan wetlands.

1. Backgroud

Wetlands play a pivotal role in sediment and nutrient cycling and retention at the catchment level and are important ecosystems for local and regional biodiversity (Smith et al. 2007). Forest fragmentation is a common disturbance affecting biological diversity, yet the impacts of fragmentation on many forest processes remain poorly understood (Flaspohler et al. 2010). Evidence has shown that larger forest, higher quality fragments are better for supporting primary forest species, but there is very little evidence to quantify the importance of small forest patches for improving connectivity or the benefit of enhanced connectivity for conserving populations of species in the landscape (Loong et al. 2016).

Air Sugihan or Sugihan wetlands is a subdistrict in Ogan Komering Ilir district, South Sumatra province, Indonesia. Before the area was set aside for a wetland reserve in April 1983 the area was being prepared for transmigrant settlers. The area covering is about 2.593 km², mostly dominated by wetlands, ranging from peatland to the mangrove zone.It is presumed total wetlands c. 75% from total area. According to the announcement by Dinas Kehutanan Kabupaten Ogan Komering Ilir (OKI), deforestation and forest degradation is ongoing in 65% of the protection forest in coastal area of OKI (YLB 2015). The Padang-Sugihan Wildlife Reserve is a Wildlife Sanctuary that borderly or within Air Sugihan wetlands, and one important fishes habitat in Sumatra (Iqbal 2004). This area is one important

breeding site for endangered Milky stork *Mycteria cinerea* (Iqbal 2008a, Iqbal 2008bTo support sustainable development for sugihan wetlands, since November 2016, we explore basic biodiversity information of Sugihan wetlands, particularly focus on fish and bird diversity. The information from these studies are summarised here.

2. Methods

From November 2016 to December 2017, two field surveys were conducted to collect information of birds and fish diversity in Sugihan wetlands, South Sumatra (Figure 1).

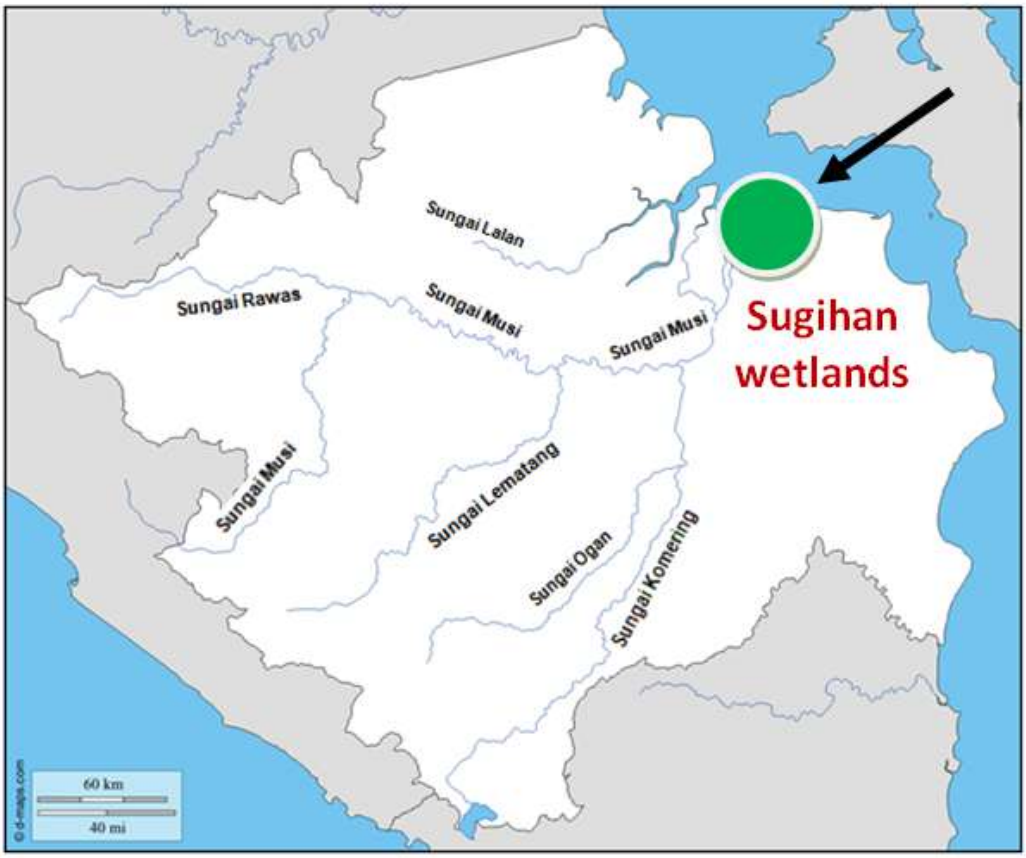

Figure 1. Sugihan wetlands, South Sumatra.

To collect information on bird diversity, three survey methods were applied (riverine survey, time point counts and incidental search), especially by audio-visual observation. Identification of birds were done with the aid field guides, mainly of MacKinnon & Phillipps (1993). For collecting data of fishes, we collect specimens from local fishermen, with additional data collected by us using hand netting and fish trap netting. The fishes were identified mainly using Kottelat et al. (1993) and Iqbal et al. (2018).

3. Result and Discussion

3.1. Birds in Sugihan wetlands

Our survey to Sugihan wetlandsfound a total of 39 species of birds. The species checklist and localities are presented in table 1. Taxonomy and scientific name follow MacKinnon & Phillipps (1993). The high conservation value species of birdswere recorded in Sugihan wetlands, including three species are listed by IUCN redlist (International Union for Conservation of Nature), eight species protected by Indonesian law, and four species listed by CITES appendix (the Convention on International Trade in Endangered Species of Wild Fauna and Flora).

There are three IUCN redlist criterias found during the survey, including: Endangered (EN), Vulnerable (VU) and Near Threatened (NT). All species protected by Indonesian law cited as P (Protected). Following CITES (2019), The CITES Appendices are lists of species afforded different levels or types of protection from over-exploitation. Appendix I lists species that are the most endangered among CITES-listed animals and plants. Appendix II lists species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled.

Table 1. Birds observed during survey on 27-30 November 2016 in Sugihan wetlands, Ogan Komering Ilir District, South Sumatra Province.

No.	Species	STATUS		
		IUCN Redlist	Protected by Indonesian law	CITES Appendix
1	*Actitis hypoleucos*			
2	*Phalacrocorax* sp			
3	*Dendrocygna javanica*			
4	*Ahinga melanogaster*	NT	P	
5	*Ixobhrychus cinnamomeus*			
6	*Egretta intermedia*			
7	*Egretta garzetta*			
8	*Butorides striatus*			
9	*Ardeola speciosa speciose*			
10	*Mycteria cinereal*	EN	P	I
11	*Leptoptilos javanicus*	VU	P	
12	*Gallinula chlorophus*			
13	*Amaurornis phoenicurus*			
14	*Nisaetus cirrhatus*		P	II
15	*Haliastur induus*		P	II
16	*Elanus caeruleus*		P	II
17	*Streptopelia chinensis*			
18	*Ducula aenea*			
19	*Treron vernans*			
20	*Cuculus* sp			
21	*Centropus sinensis*			
22	*Centropus bengalensis*			
23	*Merops phillipinus*			
24	*Collocalia* sp			
25	*Hirundo rustica*			
26	*Dinopium javanense*			
27	*Halcyon chloris*			
28	*Alcedo coerulescens*			
29	*Pycnonotus* sp			
30	*Aplonis panayensis*			
31	*Orthotomus ruficeps*			
32	*Prinia familiaris*			
33	*Acrocephalus* sp			
34	*Prinia flaviventris*			
35	*Lonchura malacca Malacca*			
36	*Aethophyga siparaja*		P	
37	*Lanius schach*			
38	*Acridotheres javanicus*		P	
39	*Ploceus* sp			
	Total	**3**	**8**	**4**

3.2. Fishes in estuarine of Sugihan wetlands

A total 32 species of estuarine fishes recorded during a field survey on August 11-15th, 2018. The species found in this area are presented in table 2. Taxonomy and scientific name follow Kottelat et al. (1993).

Table 2. Fishes recorded during survey on August 11-15th , 2018 in estuarine area of Sugihan wetlands, Ogan Komering Ilir District, South Sumatra Province.

No.	Species	Family
1	*Muraenesox* sp	Muraenesocidae
2	*Muraenesox cinereus*	Muraenesocidae
3	*Anodontostoma chacunda*	Clupeidae
4	*Nemotalosa*sp [cf. *Sardenella* sp]	Clupeidae
5	*Coilia* sp	Engraulidae
6	*Thryssa* sp	Engraulidae
7	*Stolephorus* sp	Engraulidae
8	*Mystus*sp [cf. *Arius* sp]	Ariidae
9	*Otolithes ruber*	Sciaenidae
10	*Nibea soldado*	Sciaenidae
11	*Johnius macropterus*	Sciaenidae
12	*Terapon theraps*	Terapontidae
13	*Rastrelliger kanagurta*	Scombridae
14	*Scomberoide s*sp	Carangidae
15	*Parastromateus niger*	Carangidae
16	*Sauridamicro pectoralis*	Synodontidae
17	*Periophthalmus* sp	Oxudercidae
18	*Ambassis* sp	Ambassidae
19	*Eubleekeria* sp	Leiognathidae
20	*Secutor insidiator*	Leiognathidae
21	*Lutjanus johnii*	Lutjanidae
22	*Scatophagus argus*	Scatophagidae
23	*Liza* sp	Mugilidae
24	*Nemipterus* sp	Nemipteridae
25	*Sillago sihama*	Sillaginidae
26	*Filimanus* sp	Polynemidae
27	*Eleutheronema tetradactylum*	Polynemidae
28	*Inegocia japonica*	Platycephalidae
29	*Pseudorhombus arsius*	Paralichthyidae
30	*Cynoglossus lingua*	Cynoglossidae
31	Unid species 1	
32	Unid species 2	

3.3. Reccomendation for Future Actions

The records of 39 species of birds and 32 species of estuarine fishes in Sugihan wetlands indicate that Sugihan wetlands support rich of biodiversity. In the case of other parts of many countries, biodiversity in wetlands also face high level of direct exploitation. Conservation action plan is a powerful guide conservationto develop focused strategies and measures of success (TNC 2007). When regional priorities have been set, conservation action planning is used to determine the plan of action for these priorities. The conservation action plans in Sugihan wetlands would have not been possible without information on basic data information of its biodiversity. Providing basic data of each species in Sugihan wetlands will demontrate the role of science in sustainable management of fragile wetlands biodiversity.

Acknowledgement
We are very grateful to dean of Faculty of Mathematic and Natural Science ofSriwijaya University for facilitating first author to manage this project. Thank to Sriwijaya University for grantingus to conducting research in Sugihan wetlands.

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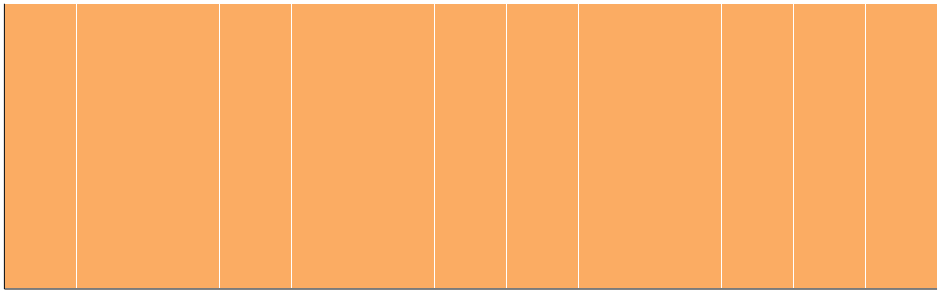

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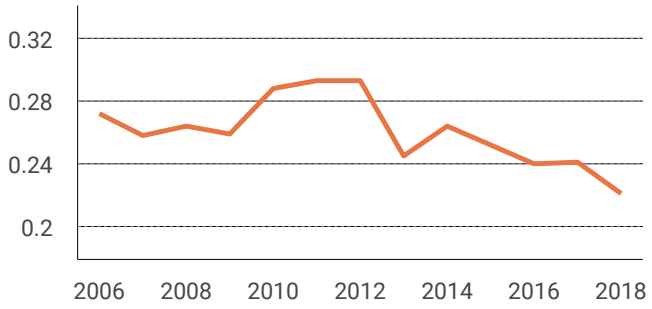

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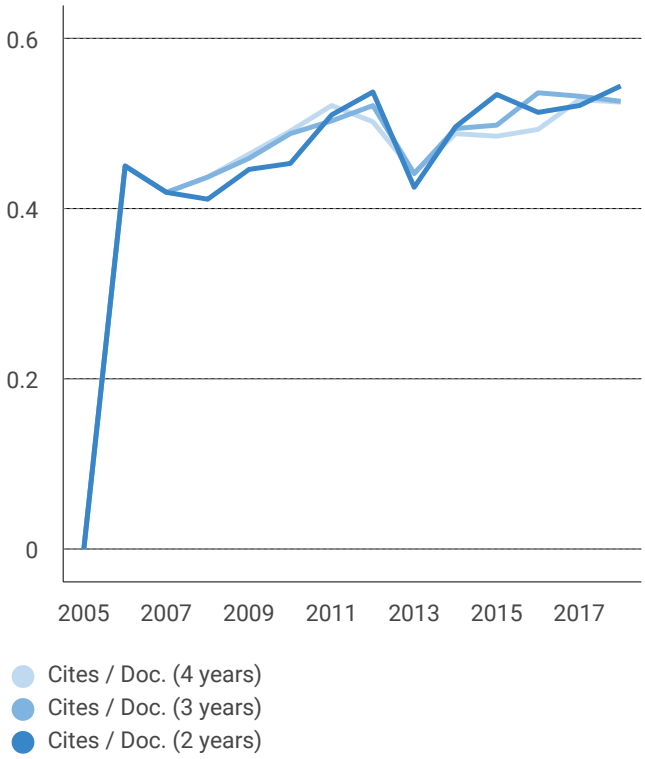

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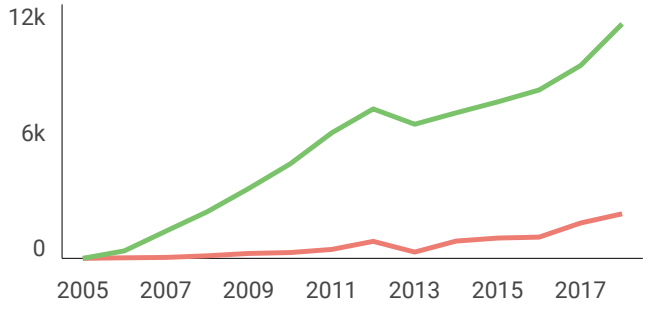

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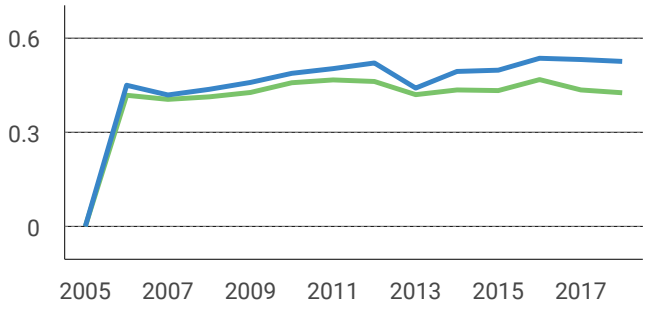

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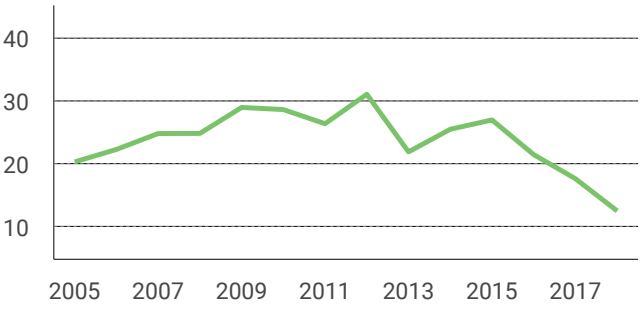

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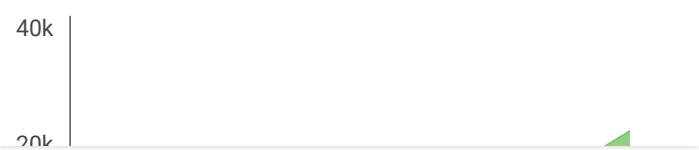

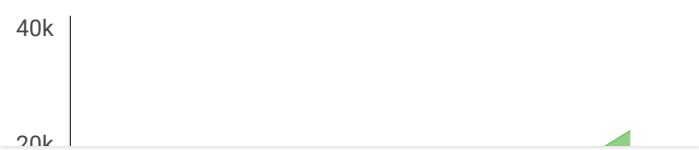

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THE 1st SRIWIJAYA INTERNATIONAL CONFERENCE ON BASIC AND APPLIED SCIENCES

"Sciences for Sustainable Development"

Horison Ultima Hotel Palembang, South Sumatra - Indonesia
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PREFACE

The 1st SRIWIJAYA INTERNATIONAL CONFERENCE ON BASIC AND APPLIED SCIENCES (SICBAS 2018) with the theme "Sciences for Sustainable Development". The conference held on November 6-7th, 2018 at the Horison Ultima Hotel Palembang, South Sumatra, Indonesia. This event is launched so as to provide a chance and venue for researchers to come together for research presentations and dissemination's. The conference is biennial important event to publish communicate they research results in basic and applied sciences.

Hopefully this international proceeding will be able to encourage students, teachers, lecturers, practitioners, researchers, and higher education community in developing scientific and academic atmosphere in Indonesia.

On behalf of the committee of the SICBAS 2018 we would like to thank to all parties for their participation in supporting this publication and we would like to invite all of researchers and scientists to take a part in the 2nd SICBAS which will be held in 2020 by The Faculty of Mathematics and Natural Sciences, Sriwijaya University.

Palembang, November 7th 2018
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5	*Ixobhrychus cinnamomeus*			
6	*Egretta intermedia*			
7	*Egretta garzetta*			
8	*Butorides striatus*			
9	*Ardeola speciosa speciose*			
10	*Mycteria cinereal*	EN	P	I
11	*Leptoptilos javanicus*	VU	P	
12	*Gallinula chlorophus*			
13	*Amaurornis phoenicurus*			
14	*Nisaetus cirrhatus*		P	II
15	*Haliastur induus*		P	II
16	*Elanus caeruleus*		P	II
17	*Streptopelia chinensis*			
18	*Ducula aenea*			
19	*Treron vernans*			
20	*Cuculus* sp			
21	*Centropus sinensis*			
22	*Centropus bengalensis*			
23	*Merops phillipinus*			
24	*Collocalia* sp			
25	*Hirundo rustica*			
26	*Dinopium javanense*			
27	*Halcyon chloris*			
28	*Alcedo coerulescens*			
29	*Pycnonotus* sp			
30	*Aplonis panayensis*			
31	*Orthotomus ruficeps*			
32	*Prinia familiaris*			
33	*Acrocephalus* sp			
34	*Prinia flaviventris*			
35	*Lonchura malacca Malacca*			
36	*Aethophyga siparaja*		P	
37	*Lanius schach*			
38	*Acridotheres javanicus*		P	
39	*Ploceus* sp			
	Total	**3**	**8**	**4**

3.2. Fishes in estuarine of Sugihan wetlands

A total 32 species of estuarine fishes recorded during a field survey on August 11-15th, 2018. The species found in this area are presented in table 2. Taxonomy and scientific name follow Kottelat et al. (1993).

Table 2. Fishes recorded during survey on August 11-15th , 2018 in estuarine area of Sugihan wetlands, Ogan Komering Ilir District, South Sumatra Province.

No.	Species	Family
1	*Muraenesox* sp	Muraenesocidae
2	*Muraenesox cinereus*	Muraenesocidae
3	*Anodontostoma chacunda*	Clupeidae
4	*Nemotalosa*sp [cf. *Sardenella* sp]	Clupeidae
5	*Coilia* sp	Engraulidae
6	*Thryssa* sp	Engraulidae
7	*Stolephorus* sp	Engraulidae
8	*Mystus*sp [cf. *Arius* sp]	Ariidae
9	*Otolithes ruber*	Sciaenidae
10	*Nibea soldado*	Sciaenidae
11	*Johnius macropterus*	Sciaenidae
12	*Terapon theraps*	Terapontidae
13	*Rastrelliger kanagurta*	Scombridae
14	*Scomberoide s*sp	Carangidae
15	*Parastromateus niger*	Carangidae
16	*Saurida micro pectoralis*	Synodontidae
17	*Periophthalmus* sp	Oxudercidae
18	*Ambassis* sp	Ambassidae
19	*Eubleekeria* sp	Leiognathidae
20	*Secutor insidiator*	Leiognathidae
21	*Lutjanus johnii*	Lutjanidae
22	*Scatophagus argus*	Scatophagidae
23	*Liza* sp	Mugilidae
24	*Nemipterus* sp	Nemipteridae
25	*Sillago sihama*	Sillaginidae
26	*Filimanus* sp	Polynemidae
27	*Eleutheronema tetradactylum*	Polynemidae
28	*Inegocia japonica*	Platycephalidae
29	*Pseudorhombus arsius*	Paralichthyidae
30	*Cynoglossus lingua*	Cynoglossidae
31	Unid species 1	
32	Unid species 2	

3.3. Reccomendation for Future Actions

The records of 39 species of birds and 32 species of estuarine fishes in Sugihan wetlands indicate that Sugihan wetlands support rich of biodiversity. In the case of other parts of many countries, biodiversity in wetlands also face high level of direct exploitation. Conservation action plan is a powerful guide conservationto develop focused strategies and measures of success (TNC 2007). When regional priorities have been set, conservation action planning is used to determine the plan of action for these priorities. The conservation action plans in Sugihan wetlands would have not been possible without information on basic data information of its biodiversity. Providing basic data of each species in Sugihan wetlands will demontrate the role of science in sustainable management of fragile wetlands biodiversity.

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LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG (*PEER REVIEW*)
KARYA ILMIAH: PROSIDING

Judul Karya Ilmiah : Providing biodiversity information to support sustainable development of Sugihan wetlands, South Sumatra

Jumlah Penulis : **Arum Setiawan**, Muhammad Iqbal, Doni Setiawan, and Indra Yustian

Identitas Prosiding :
a. Nama Prosiding : IOP Conf. Series: Journal of Physics: Conf. Series (**Scopus**), Sriwijaya International Conference on Basic and Applied Science 2018
b. ISBN/ISSN : 1742-6588/1742-6596
c. Nomor/Volume/Hal : 1/1282/1-5
d. Penerbit : Fakultas MIPA Universitas Sriwijaya
e. Jumlah Halaman 5

Kategori Publikasi Jurnal Ilmiah (Beri √pada kategori yang tepat) :
- ☑ Prosiding Forum Ilmiah Internasional
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2	Linieritas	Sudah linier dengan bidang biologi konservasi

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Ruang Lingkup dan kedalaman pembahasan (30 %)	9						7
Kecukupan dan Kemutahiran data/Informasi dan metodologi (30 %)	9						9
Kelengkapan unsur dan Kualitas penerbit / prosiding (30 %)	9						9
Total = (100 %)	30						28
Kontribusi Pengusul (Penulis Pertama/Anggota Utama)	Penulis Utama=(0,6x28)= **16,8**						

KOMENTAR/ULASAN PEER REVIEW	
Kelengkapan dan Kesesuaian Unsur	Paper terkait informasi perkembangan biodiversitas secara berkelanjutan di Sugihan wetlands, Sumatera Selatan. Isi paper sudah memenuhi kaidah-kaidah karya ilmiah dan sudah sesuai dengan bidang biologi konservasi
Ruang Lingkup dan Kedalaman Pembahasan	Hasil penelitian dibahas cukup komprehensif dengan penyampaian pembanding dari temuan-temuan penelitian lainnya dan teori terkait. Referensi yang diacu dalam pembahasan sudah cukup update untuk bidang kajian ini.
Kecukupan & Kemutakhiran Data & Metodologi	Data-data hasil penelitian sudah baik dan didukung peta lokasi sampling, tabel dan gambar yang ditampilkan menarik. Data didapatkan dengan menggunakan metode yang sudah standard.
Kelengkapan Unsur & Kualitas Penerbit	Penerbit Fakultas MIPA Universitas Sriwijaya berkualitas baik, tidak termasuk predatory publisher, dan prosiding terindeks di scopus

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2.2.

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG (*PEER REVIEW*)
KARYA ILMIAH: PROSIDING

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- Kelengkapan dan Kesesuaian Unsur	Format memenuhi kelengkapan.
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