INTERNATIONAL RESEARCH COLLABORATION



NATURAL REGENERATION THROUGH VEGETATION SUCCESSION IN POST-BURNING PEATLAND ECOSYSTEMS

(PART OF PENELITIAN PENUNJUKKAN LANGSUNG RESTORASI LAHAN GAMBUT SEBAGAI TINDAK PREVENTIF TERHADAP PERUBAHAN IKLIM DAN MEDIA PENDIDIKAN LINGKUNGAN BAGI MASYARAKAT PADA EKOSISTEM LAHAN BASAH)

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RESEARCH OBJECTIVE

To develop various knowledge about post-

RESEARCH 01 BACKGROUND



- Biodiversity in peatlands belonging to Unsri Inderalaya burned in 2015, resulting in changes to the ecosystem.
- To study the ability of vegetation to grow naturally on peatlands after burning for almost 10 years, research was conducted on plants biodiversity.

burn peat swamp vegetation and cultivation techniques for various forest plants on peat swamp land to enhance vegetation biodiversity.

RESEARCH METHOD

- The study area at the Arboretum of Inderalaya Campus, Sriwijaya University, is located at Universal Transverse Mercator (UTM) coordinates 485 M 460230 E 9643743 S.
- Survey and data collection by dividing the location into 8 plots and several subplots. Information on the types and number of plants is counted for each individual in the plots and subplots.
- Analysis uses the Summed Dominance Ratio (SDR), Shannon Diversity Index, Simpson, Sørensen, Whittaker, Hill's Diversity, Pielou's evenness index.



RESULT AND DISCUSSION

• The results of this research are very important to support SDGs (points 4, 13 and 15) by Unsri.



September 2015 (Post-fire)

April 2016 (1-year post-fire)



July 2018 (3-year post-fire) May 2020 (7-year post-fire) Figure 1. Google EarthTM satellite image of the natural vegetation recovery process in the Gambur area of the

Table 2. Species Richness, Evenness, and Diversity in Eight Observation Plots of the Peat Forest Arboretum.

T., 1.	T1	T2	T3	T4	T5	T6	T7	T8
Indices				%	, D			
Hill's num	bers							
N0	3.00	4.00	5.00	6.00	5.00	6.00	5.00	4.00
N1	2.61	2.19	3.68	2.09	4.75	4.27	3.83	3.78
N2	2.32	1.66	2.95	1.45	4.55	3.56	3.23	3.60
Evenness								
E5	0.87	0.57	0.81	0.41	0.97	0.81	0.83	0.96
Diversity								
Shannon	0.96	0.78	1.30	0.74	1.56	1.45	1.34	1.33
Simpson	0.57	0.40	0.66	0.31	0.78	0.72	0.69	0.72

Table 1 Arbore	l. Summed tum	Dominance I	Ratio (SDR) in Eight Observat	ion Plots of the Peat Fo	prest	
Plot Peat Depth (cm)	Growth Stage	Individual ID	Spesies	Famili	SDR	
T1	Tree		-	-	0	
(65)	Pole	1	Melaleuca spp.	Myrtaceae	28.13	
	Sapling		Melaleuca spp.	Myrtaceae	30.91	
	Seedling	2	Stenochlaena palustris	Aspleniaceae	17.07	
		3	Melastoma malabathricum	Melastomataceae	23.90	
T2	Tree		-		0.00	
(5.5)	Pole	1	Melaleuca spp.	Myrtaceae	28.33	
	Sapling		Melaleuca spp.	Myrtaceae	27.12	
	Seedling		Melaleuca spp.	Myrtaceae	22.27	
		2	Nephrolepis biserrata	Nefrolepidaceae	7.95	
		3	Acacia mangium	Fabaceae	3.18	
		4	Melastoma malabathricum	Melastomataceae	11.14	
T3	Tree		-	-	0.00	
(43)	Pole	1	Melaleuca spp.	Myrtaceae	31.50	
	Sapling		Melaleuca spp.	Myrtaceae	24.05	
	Seedling	2	Nephrolepis biserrata	Nefrolepidaceae	10.67	
		3	Melastoma malabathricum	Melastomataceae	3.56	
		4	Pteris vittata	Pteridaceae	17.78	
		5	Lygodium microphyllum	Schizaeaceae	12.45	
T4	Tree	1	Alstonia scholaris	Apocynaceae	19.31	
(74)		2	Acacia mangium	Fabaceae	16.42	
	Pole	3	Melaleuca spp.	Myrtaceae	5.78	
	Sapling		Melaleuca spp.	Myrtaceae	40.46	
	Seedling	4	Melastoma malabathricum	Melastomataceae	6.01	
		5	Lepironia articulata	Cyperaceae	6.01	
		6	Pteris vittata	Pteridaceae	6.01	

T5	Tree		-		0.00
(125)	Pole	1	Eucalyptus robusta	Myrtaceae	4.05
	Sapling	2	Alstonia scholaris	Apocynaceae	34.32
	Seedling	3	Tetracera indica	Dilleniaceae	22.69
		4	Syzygium antisepticum	Myrtaceae	23.37
		5	Stenochlaena palustris	Blechnaceae	15.58
T6	Tree	1	Syzygium antisepticum	Myrtaceae	24.80
(76.9)	Pole	2	Pternandra coerulescens	Melastomataceae	8.70
		3	Melicope ellervana	Rutaceae	11.29
	Sapling	4	Uncaria rhynchophylla	Rubiaceae	3.98
		5	Myrtus communis	Myrtaceae	22.87
	Seedling	6	Nephrolepis biserrata	Nefrolepidaceae	28.36
T7	Tree	1	Cedrela spp.	Meliaceae	36.89
(84)	Pole	2	Dillenia spp.	Dilleniaceae	16.44
	Sapling	3	Oroxylum indicum	Bignoniaceae	6.32
		4	Ochroma <u>pyramidale</u>	Malvaceae	2.93
	Seedling	5	Stenochlaena palustris	Blechnaceae	37.42
Т8	Tree				
(72)	Pole	1	Acacia mangium	Fabaceae	31.72
		2	Melaleuca spp.	Myrtaceae	18.92
	Sapling		-		0.00
	Seedling		Melaleuca spp.	Myrtaceae	7.05
		3	Melastoma malabathricum	Melastomataceae	14.10
		4	Stenochlaena palustris	Blechnaceae	28.21

Note: N0 is the number of species types, N1 is the number of abundant species, N2 is the number of dominant species, and E5 is the modified Hill evenness ratio.

Table 3. Similarity and Dissimilarity Indices Based on Species Presence or Absence Data from Eight Observation Plots in the Peat Forest Arboretum.

T. 1	T1	T2	T3	T4	T5	T6	T7	
Indices	%							
Sørensen's index (simil	larity)							
T2	0.57							
T3	0.50	0.67						
T4	0.44	0.60	0.55					
T5	0.25	0.00	0.00	0.18				
T6	0.00	0.20	0.18	0.00	0.18			
T7	0.25	0.00	0.00	0.00	0.20	0.00		
T8	0.86	0.75	0.44	0.60	0.22	0.00	0.22	
Whittaker's betadiversi	ty index (dissi	imilarity)						
T2	0.43							
T3	0.50	0.33						
T4	0.56	0.40	0.45					
T5	0.75	1.00	1.00	0.82				
T6	1.00	0.80	0.82	1.00	0.82			
T7	0.75	1.00	1.00	1.00	0.80	1.00		
T8	0.14	0.25	0.56	0.40	0.78	1.00	0.78	

Note : The number falls within the range (0-100%) indicating a higher value.

Table 4. Comparison of the Number of Same and Different Species Among the

Communities of Eight Plots in the Arboretum Peat Forest Observation.

Comparison of	T1	T2	T3	T4	T5	T6	T7	
Amount	0⁄0							
	•••••							
The Similar Species(a)								

The Similar Spesic	s(a)						
T2	2						
T3	2	3					
T4	2	3	3				
T5	1	0	0	1			
T6	0	1	1	0	1		
T7	1	0	0	0	1	0	
T8	3	3	2	3	1	0	1
Species that are no	t found in b but are r	not present in o	c	1			
T2	2						
T3	3	2					
T4	4	3	3				
T5	4	5	5	4			
T6	6	5	5	6	5		
T7	4	5	5	5	4	5	
T8	1	1	2	1	3	4	3
Species that are no	t found in c but are r	ot present in l	5	·	· · · · ·		
T2	1						
T3	1	1					
T4	1	1	2				
T5	2	4	5	5			
T6	3	3	4	6	4		
T7	2	4	5	6	4	6	
T8	0	1	3	3	4	6	4
Note (a) the total "	when of maning the	t a a a un in hat	h and deatar (h)	the total mum	hanafanaai	a that and	





05 CONCLUSION

Note : (a) the total number of species that occur in both quadrats; (b) the total number of species that occur in

the neighbouring quadrat but not in the focal one; (c) the total number of species that occur in the focal quadrat

but not in the neighbouring one.

The study identified 20 species from 16 families, with the lowest species richness in T1 and highest in T4 and T6. The Hill ratio and Shannon-Wiener index show high diversity levels in plots T5 and T6, with a difference of 0.09-0.11%. Simpson Index shows almost identical diversity levels, with low values in T2 and T4. Sørensen's index showing T5, with high diversity, has the highest similarity with T1, while T4 has low diversity.

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