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Online Trading of Indonesian Butterfly Products

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Abstract:
Butterflies are one of the wildlife commodities that have begun to be traded online. This study aimed to determine the data of butterflies traded online ranging from characteristics, protection status, product categories, trade media, and scope of demand. The methods used were direct observation through the internet and conventional shops, interviews, and literature studies. The results of the study found that 360 species from 5 families are traded and 47 species of which have protection status (conservation status). Butterflies are traded in various forms, namely dead specimens, live specimens, offsets, embedding, handicrafts and accessories. There are 16 types of butterfly trading media known online, namely e-commerce (6), social media (2), forum (3) and website (5). Indonesian butterflies are traded, both domestically and abroad. The demand for Indonesian butterfly products is mostly from European countries. The potential of butterflies as a trading commodity needs to be harmonized with conservation efforts so that their sustainability is maintained.

Keywords: *Butterfly, conservation, online, trade*

1. Introduction

The use of wild animals has developed into commercial uses, one of which is the animal trade. Economic factors are the main motivation for people to trade in wildlife (Nijman 2010). Wildlife trade includes live and dead animals, body parts of animals and their derivative products. Wild animals are also used as pets, food ingredients, medicines and accessories. Wildlife trade is included in the activities of using wild animals. This is regulated in PP No. 8 of 1999 concerning the Utilization of Wild Plants and Animals. The online wildlife trade is gradually increasing (Williams 2001 in Krishnasamy and Stoner 2016).

One of the wildlife commodities that have a fairly high economic value is the butterfly. Butterflies have beautiful colours and wing shapes so economically, butterflies have a selling value either as recreational objects, as collections or for scientific purposes (Muhammadiyah 2014). Online butterfly trading is starting to be found in various internet media. However, research on the butterfly trade in Indonesia, both conventionally and online, is still rare. The increasing number of internet users in Indonesia and the shift in trading trends from conventional to online need to be accompanied by a comprehensive collection of butterfly trading data so that they can be studied further. This study aimed to identify the characteristics of butterflies, their protection status and product categories of butterflies traded online, and Identify internet media where online butterfly trading occurs and the scope of demand for butterfly products.

2. Methods

The research was conducted in August-September 2019. The data collection process was carried out online and conventionally in Jakarta as comparison data. Internet media is categorized into (a) e-commerce, (b) buying and selling forums, (c) websites, and (d) social media.

Data collection was assisted by computers and internet networks to access trading media, butterfly species identification guides, statistical data to support research, tally sheets to record the data obtained and word processing software as well as data in the form of Microsoft Word and Excel. The object of research is Indonesian butterflies which are traded online.

The research was conducted in several stages. The stages of the research are: (1) Searching on e-commerce/forums/sites/social media; (2) Determining product keywords; (3) Identifying products; and (4) Comparing collected data. The method used is the direct observation method, namely the data collection method in which the researcher observes, examines, measures and records information as witnessed during the study. Technically, in this

study, observations were made by visiting, tracing and recording online butterfly trading activities. Interviews and literature studies were also conducted to supplement information about the online or conventional butterfly trade. The types of data to be collected are presented in Table 1.

Aspect of Study	Collected Data	Methods	Data Sources
Characteristics of butterflies	Family	Observation, literature study	Online sellers, Penjual daring, species identification manual,
	Species		
	Gender		
Protection status	Regulation of Minister of Environment and Forestry P.106 year 2018	Literature study	Regulation of Minister of Environment and Forestry,CITES database, IUCN database
	The CITES appendices,		
	IUCN Red List		
Butterfly product categories	Types of product	Observation, interview	Online sellers
	Origin of product delivery		
Trading media	Names of media	Observation	Marketplace database
	Types of media		
	How to purchase		
Scope of product demand	Domestic delivery destinations	Interview, literature study	Online sellers,CITES database
	Overseas shipping destinations		

Table 1: Types of Collected Data

Data analysis was carried out in descriptive quantitative and descriptive qualitative. Quantitative data is processed and analyzed in the form of frequency tables, crosses or graphs (Arimbi 2017). The quantitative data is then interpreted to support the qualitative data. Qualitative data is processed by summarizing data, classifying, simplifying, tracing and linking with research objectives. The data obtained are presented descriptively in accordance with the research discussion so that they support drawing conclusions and determining follow-up recommendations (Situngkir 2009).

3. Results

3.1. Characteristics, Protection Status, and Butterfly Product Categories

The characteristics of the identified butterflies include the species name, family and sex for each butterfly traded. Each species found is then identified its protection status based on the laws in force in Indonesia, IUCN and CITES. The butterfly products found are also grouped by product category. The results regarding the above are then presented as follows.

3.1.1. Butterfly Families and Species

Based on the results of the study, the number of butterfly species traded was obtained as many as 360 species from 5 families. The family of traded butterflies consists of the families of Papilionidae, Pieridae, Nymphalidae, Lycaenidae and Hesperidae. Details regarding the number of butterfly species traded are presented in Figure 1.

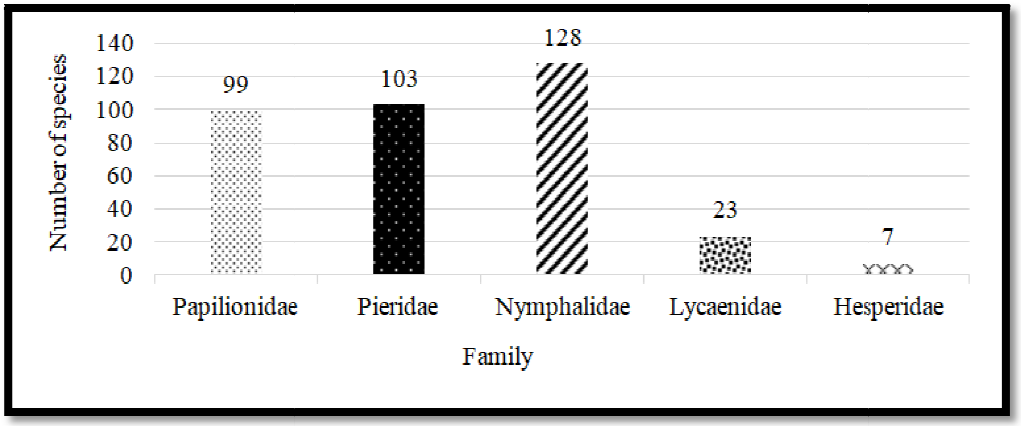

Figure 1

3.1.2. Butterfly Gender

Some sellers include a description of the gender of the product. Details regarding the percentage of butterfly sex based on the number of species are presented in Table 2.

No.	Gender	Number of Species	Percentage
1.	Only male	197	54,72%
2.	Only female	18	5%
3.	Male and female	145	40,28%

Table 2: Percentage of Gender of the Traded Butterflies

3.1.3. Butterfly Protection Status

The results showed that of the 360 species of butterflies that were traded, 47 species had protection status. The list of butterfly species that have a protected status is presented in Table 3.

No.	Family	Species	P.106/2018	IUCN	CITES
1.	Pieridae	Deliasrosenbergi	-	LC	-
2.	Pieridae	Deliasperiboea	-	LC	-
3.	Papilionidae	Troidesvandepolli	Protected	-	II
4.	Papilionidae	Troidesoblongomaculatus	Protected	LC	II
5.	Papilionidae	Troidesmiranda	Protected	LC	II
6.	Papilionidae	Troideshypolitus	Protected	LC	II
7.	Papilionidae	Troideshelena	Protected	LC	II
8.	Papilionidae	Troideshaliphron	Protected	LC	II
9.	Papilionidae	Troidesdohertyi	Protected	VU	II
10.	Papilionidae	Troidescuneifera	Protected	LC	II
11.	Papilionidae	Troidescriton	Protected	LC	II
12.	Papilionidae	Troidesamphrysus	Protected	LC	II
13.	Papilionidae	Trogonopterabrookiana	Protected	LC	II
14.	Papilionidae	Papilioneumoegeni	-	VU	-
15.	Papilionidae	Papiliojordani	-	VU	-
16.	Papilionidae	Ornithopteratithonus	Protected	LC	II
17.	Papilionidae	Ornithopterarothschildi	Protected	LC	II
18.	Papilionidae	Ornithopterapriamus	Protected	LC	II
19.	Papilionidae	Ornithopteraparadisea	Protected	LC	II
20.	Papilionidae	Ornithopterameridionalis	Protected	NT	II
21.	Papilionidae	Ornithoptera goliath	Protected	LC	II
22.	Papilionidae	Ornithopteracroesus	Protected	NT	II
23.	Papilionidae	Ornithoptera chimaera	Protected	LC	II
24.	Papilionidae	Ornithopteraaesacus	Protected	VU	II
25.	Papilionidae	Graphiumstresemanni	-	VU	-
26.	Papilionidae	Graphiummeyeri	-	LC	-
27.	Papilionidae	Graphiummacfarlanei	-	LC	-
28.	Papilionidae	Graphiumdorcus	-	LC	-
29.	Papilionidae	Graphiumdeucalion	-	LC	-
30.	Papilionidae	Atrophaneuraluchti	-	VU	-
31.	Papilionidae	Losaria coon	-	LC	-
32.	Nymphalidae	Taenarishorsfieldii	-	LC	-
33.	Nymphalidae	Paranticatimorica	-	EN	-
34.	Nymphalidae	Paranticacrowleyi	-	LC	-
35.	Nymphalidae	Paranticaalbata	-	NT	-
36.	Nymphalidae	Ideopsis vulgaris	-	LC	-
37.	Nymphalidae	Ideopsisklassika	-	LC	-
38.	Nymphalidae	Idea tambusisiana	-	VU	-
39.	Nymphalidae	Euploeagamelia	-	NT	-
40.	Nymphalidae	Euploeaeupator	-	LC	-
41.	Nymphalidae	Danauschrysippus	-	LC	-
42.	Nymphalidae	Cyrestisnivea	-	LC	-
43.	Nymphalidae	Cirrochroaregina	-	LC	-
44.	Nymphalidae	Cethosiamyrina	Protected	-	-
45.	Lycaenidae	Neomyrinanivea	-	LC	-
46.	Lycaenidae	Paralaxitaorphna	-	LC	-
47.	Lycaenidae	Paralaxitadamajanti	-	LC	-

Table 3: Butterfly Species with Protection Status

Information: LC=Least Concern, NT=Near Threatened, VU=Vulnerable, EN=Endangered, II=Appendix 2

3.1.4. Butterfly Product Categories

Butterfly trade products are categorized based on the shape of the product. The results of the traded butterfly product categories are presented as follows.

3.1.4.1. Types of Butterfly Product

The results of the study found that 8498 butterfly products were traded online. These products are categorized into: (1) dead specimen products, (2) live specimen products, (3) offsets, (4) embedding, (5) handicrafts and (6) accessories. Details regarding the number of butterfly products traded in each trading medium are presented in Table 4.

No.	Types of Media	Numbers of Products					
		Dead Specimen	Live Specimen	Offset	Embedding	Handicrafts	Accessories
1.	*E-commerce*	1996	-	1597	3768	187	128
2.	Social media	95	10	53	45	4	-
3.	Forum	68	-	17	-	-	-
4.	Sites	530	-	-	-	-	-
Total		2689	10	1667	3813	191	128

Table 4: Butterfly products

3.1.4.2. Origin of Product Delivery

Butterfly trade products are sent from various regions according to the seller's domicile. The number of sellers selling Indonesian butterfly products is 145 sellers, consisting of 100 sellers from various provinces in Indonesia and 45 sellers from abroad. Details regarding the origin of butterfly product domestic delivery are presented in Table 5.

No.	Province	Number of Sellers				Total
		E-commerce	Social Media	Forum	Websites	
1.	Aceh	1	-	-	-	1
2.	Bali	1	-	-	1	2
3.	Banten	2	-	-	-	2
4.	Jakarta	31	2	4	-	37
5.	Jambi	1	-	-	-	1
6.	Jawa Barat	13	2	-	-	15
7.	Jawa Tengah	8	-	1	-	9
8.	JawaTimur	2	2	2	1	7
9.	Kalimantan Barat	1	-	-	-	1
10.	Lampung	1	-	-	-	1
11.	Nusa Tenggara Barat	1	-	-	-	1
12.	Riau	1	-		-	1
13.	Sulawesi Selatan	15	-	1	-	16
14.	Sumatera Barat	2	-	-	-	2
15.	Sumatera Selatan	-	-	1	-	1
16.	Yogyakarta	3	-	-	-	3

Table 5: Domestic Delivery

Apart from domestic, Indonesian butterfly products are also recorded to be sent from various countries in the world. The countries that send butterfly products from Indonesia are presented in Table 6.

No.	Country	Number of Sellers			Total
		E-commerce	Social Media	Websites	
1.	United States of America	11	1	1	13
2.	Australia	1	-	-	1
3.	Austria	1	-	-	1
4.	Canada	1	-	-	1
5.	China	13	-	-	13
6.	Czech	1	-	1	2
7.	Georgia	1	-	-	1
8.	Germany	1	1	1	3
9.	Malaysia	1	-	-	1
10.	France	1	1	-	2
11.	Russia	2	-	-	2
12.	Thailand	2	-	-	2
13.	England	3	-	-	3

Table 6: Overseas Shipping

3.2. Media of Trade and Scope of Demand for Butterfly Products

The trading media identified in this study include the name of the media, the type of media, the website address and the number of sellers in each media. The mode of purchase and the scope of product demand are also identified and presented as follows.

3.2.1. Names and Types of Trading Media

There are 16 kinds of online trading media explored in this study. The media consists of e-commerce, social media, forums and buying and selling sites. The online trading media used for buying and selling butterfly products are presented in Table 7.

E-commerce		Social media		Forum		Websites	
Name of media	Number of Sellers	Name of Media	Number of Sellers	Name of Media	Number of Sellers	Name of Media	Number of Sellers
Tokopedia	43	Facebook	4	Kaskus	7	Papua Insect Shop	1
Shopee	15	Instagram	2	Ceriwis	3	Pikupu	1
Bukalapak	24			*Insect Net	3	*Insect World	1
Lazada	11					*The Insect Collector	1
*eBay	25					*Insect Trade	1
*Amazon	3						
Total	121		6		13		5

Table 7: Trading Media of Butterfly Products
*Information: *Foreign Media*

3.2.2. How to Purchase

Butterfly trading products that are traded online have several variations in the way they are purchased. The method of purchase depends on which medium was used when purchasing the product. Based on the results of the research, the scheme for buying butterfly products online can be categorized into transactions with the help of intermediaries and transactions without the help of intermediaries.

3.2.3. Scope of Product Demand

Based on the results of interviews, domestic demand for butterfly products almost occurs in all parts of Indonesia. During the research, various areas such as Central Jakarta, East Jakarta, Tangerang, Bogor, Bandung, Surabaya and various areas in Bali such as Denpasar, Badung and Sanur were said to have purchased butterfly products online. The breadth of internet coverage allows other regions not mentioned above to also purchase butterfly products. The demand for Indonesian butterfly products is also in demand by the international market. The results showed that as many as 13 countries resell butterfly products from Indonesia (Table 6) and based on interviews, Indonesian butterfly products are sold online to several countries such as Malaysia, Singapore, Japan, Korea, Switzerland and the Netherlands. Based on the

CITES database from 2012-2018, it was recorded that no less than 30 countries were export destinations for Indonesian butterflies, especially butterflies that have CITES Appendix II protection status. 19 countries from the European continent, 4 countries from the Americas, 5 countries from the Asian continent, and 2 countries from the Oceania continent were recorded as export destinations for Indonesian butterflies.

4. Discussion

4.1. Characteristics, Protection Status, and Butterfly Product Categories

The results showed that the characteristics of butterflies traded online were quite diverse. Some of the traded butterflies also have a protected status from unprotected to threatened in nature. Butterflies that are found are also traded in various forms. The discussion regarding the characteristics, protection status and product categories of butterflies is presented as follows.

4.1.1. Butterfly Families and Species

Butterflies traded online include 5 families, namely Papilionidae, Pieridae, Nymphalidae, Lycaenidae and Hesperidae. The Nymphalidae family has the highest number of species traded online (128 Species). Smart (1991) in Sutra et al. (2012) stated that species from the Nymphalidae family have a large number in nature, are polyphagous, cosmopolitan and active to fly so that they are easy to adapt to the environment and have a wide range of distribution. According to Morris et al. (1985) species from the genus of Delias and the genus of Ornithoptera are the species most in demand by the world market. The genus Delias is one of the genera of the family Pieridae and the genus Ornithoptera is one of the genera of the family Papilionidae. The results also showed that species from the genus Delias became the most traded species from the family Pieridae (78 species). Traded species from the Papilionidae family are more diverse, not only from the genus Ornithoptera but species from other genera such as Graphium (26 species), Papilio (31 species), Trogonoptera (1 species) and Troides (10 species). This genus is in great demand by the world market because of its large size, beautiful pattern and wings, and because of its rarity.

4.1.2. Butterfly Gender

More male butterflies are traded compared to female butterflies. One of the motivations for someone to collect butterflies is because of beauty or aesthetics (Morris et al. 1985). Patterns and colours of male butterflies are more varied and attractive. More female butterflies are used for breeding so the number of female butterflies traded is much less. This is one of the reasons why more male butterflies are traded than female butterflies.

4.1.3. Butterfly Protection Status

The results showed that as many as 21 species of butterflies traded were protected species. According to Law. 5 of 1990, trading protected animals is a prohibited and unlawful act. Protected animals can be used including trade if they are the result of captivity, not caught from nature. Based on the research results, most sellers do not attach evidence of the origin of the protected species so that the legality status of the species is still in question.

This study shows that 33 species are included in the LC (Least Concern) category, 4 species are in the NT (Near Threatened) category, 7 species are in the VU (Vulnerable) category and 1 species is in the EN (Endangered) category. Species with the LC category are species that have a low risk of extinction, species with the NT category are species that are almost threatened. Species that are included in VU are species that are vulnerable to extinction and species that are included in EN are species that are threatened with existence in nature. As many as 5 out of 7 species belonging to the VU category and 1 species belonging to the EN category do not have protection status either under Indonesian law or according to CITES.

Animal species are divided into 3 categories in the CITES Appendix which regulates the international trade policy for these animals. There are 20 butterfly species included in CITES Appendix II in this study. Appendix II is a list of names of plant and animal species that will become endangered if their trade is not strictly controlled. Trading for Appendix II is not prohibited but requires special permission from the Management Authority recommended by the Scientific Authority, this applies to living species and their derivative products (Soehartono&Mardiastuti 2003 in Syaputra 2011).

4.1.4. Butterfly Product Categories

Butterflies traded during the study were found in the form of raw materials (specimens) and finished materials (decorative). Based on the research results, Indonesian butterfly products are not only sold domestically but also sold globally by sellers from various countries. The discussion regarding product categories and the origin of product delivery is presented as follows.

4.1.4.1. Types of Butterfly Products

Morris et al. (1985) categorized the butterfly trade into three types, namely: decorative trade, specialist trade and live trade. Based on the results of the research, butterfly product categories that are included in the decorative trade are products in the form of offset, embedding, handicrafts and accessories. Decorative trade aims to meet the needs of buyers in terms of beauty and uniqueness. Embedding is the most widely traded decorative product. This product is a craft made of resin. Products in the form of dead specimens are the second most traded product. Die specimen products belong to the specialist trade. The last type of trading is live trading. Based on the results of this study, live specimens that are traded are

found in the form of pupae. Purchasing live specimens is intended to be maintained. Live trade is also carried out to supply butterfly species from one captivity to another.

4.1.4.2. Origin of Product Delivery

The province of Jakarta with 37 sellers is the province with the most sellers of butterfly products in Indonesia. According to Mardiastuti (2011), Jakarta is indeed a location where wildlife trade is common, so it is categorized as a yellow spots location. As the nation's capital, the accessibility of transportation to and from Jakarta is very diverse, either by land, sea, or air. Another location of concern is the province of South Sulawesi. This location is known as a habitat for various species of butterflies. Conventional trading of butterfly products has also been going on for a long time in this area. Indonesian butterfly products are also recorded as being shipped from abroad. America and China are the countries that sell the most Indonesian butterfly products. Sodhi et al. (2004) and Nijman (2010) stated that China and several other regions in Southeast Asia are categorized as the most frequent hotspots for wildlife trade.

4.2. Media of Trade and Scope of Demand for Butterfly Products

Online trading media is used to assist the trade process with a wider area coverage. The existence of butterfly product offers from the seller is of course due to demand from buyers. The discussion regarding the trading media and the scope of demand for butterfly products is presented as follows.

4.2.1. Names and Types of Trading Media

Domestic trade media are trading media that are commonly visited by Indonesian internet users and they serve delivery to the Indonesian region. The media consist of Tokopedia, Bukalapak, Shopee, Lazada, Facebook, Instagram, Kaskus, Ceriwis, Papua Insect Shop and Pikupu. Foreign online trade media are trade media that sell butterfly products from Indonesia to be resold worldwide, this media consists of eBay, Amazon, Insect Net, Insect World, The Insect Collector, and The Insect Trade. The results showed that the e-commerce trading media was the most widely used medium forselling butterfly products. A total of 121 sellers were recorded to display their trade products in this media.

Saragih and Ramdhany (2012) state the notion of a forum as a place for discussion that involves many people in one discussion forum. The Kaskus buying and selling forum is the most popular media forum in Indonesia, while the foreign forum found in this research is a special forum that sells various types of insects, namely Insect Net.

Social media is a place that is used to communicate with each other and exchange information directly even though they are separated by distance (Maoyan 2014). Butterfly products sold on social media are found in 2 types of social media. The social media are Facebook and Instagram. Facebook has a feature to create groups. Butterfly products that are sold on Facebook are found in a special group for buying and selling animals. Apart from Facebook, there are also butterfly products traded on Instagram. Found 2 accounts that specifically traded insect products, especially butterflies. Iswara (2016) in Arimbi (2017) states that the majority of buyers find it easy when making online purchases on social media.

The site or website of the seller that was explored in this study became the second most common medium for trading butterfly products. It is known that 530 products are sold here. Uniquely, all the products sold are dead specimens. Dead specimens are the only products traded because the target market of this media is people who are experts on butterflies, namely collectors or researchers.

4.2.2. How to Purchase

The purchase method is divided into two ways, namely the purchase method without an intermediary and the purchase method with the help of a third intermediary. The way to buy without intermediaries is by direct interaction between buyers and sellers. This way of buying is common in forum sales media, websites and social media. Meanwhile, the purchase method using a third intermediary is generally used in e-commerce sales media. Technically all e-commerce is an intermediary between sellers and buyers in the buying and selling process. One aspect that determines the online shopping media is the security factor. Until now, shopping on e-commerce media has become the choice of many people because of the safe and easy way of purchasing.

4.2.3. Scope of Product Demand

Indonesia is one of the main butterfly exporting countries in the world (Nijman 2010). The results of the study show that there is quite a lot of demand for Indonesian butterfly products in foreign countries. As many as 30 countries officially recorded by CITES have imported butterflies from Indonesia. European countries import the most Indonesian butterfly products, this is in accordance with Nijman's (2010) statement which states that European and American countries are the main importers of butterfly products. Butterfly products that are demanded domestically tend to be decorative. The development of buying and selling technology has further expanded the scope of the sales area. When compared to conventional methods, selling butterfly products online has a much wider market scope.

Conventional or online butterfly trading cannot be separated from the involvement of various parties and various stages. The butterfly trade begins with collecting raw materials for butterflies by catching them directly from nature or breeding them in captivity, then distributing them to sellers. Sellers can be a collector, namely a person who collects and buys butterflies from catchers or breeders for resale, then a craftsman, namely a person who buys butterflies to be processed into decorative products and a seller who buys finished products so that they can be sold directly. to consumers. Merchants distribute butterfly products to buyers conventionally or online. Buyers of butterfly products consist of

domestic buyers who generally buy butterfly products as personal collections and foreign buyers who buy butterfly products intending to be collected or resold in their home country.

5. Conclusions and Recommendations

5.1. Conclusions

- Butterfly species traded online as many as 360 species from 5 families (Papilionidae, Pieridae, Nymphalidae, Lycaenidae and Hesperidae) and male butterflies are the most frequently traded with a percentage of 54.72% of the total species encountered. A total of 47 species has a 'protected' status. Butterfly trade products are categorized into dead specimen products (31.6%), live specimen products (0.1%), offset (19.6%), embedding (44.9%), handicrafts (2.2%) and accessories (1.5%).
- There are 16 types of online trading media consisting of 6 types of e-commerce, 2 types of social media, 3 types of buying and selling forums and 5 types of sites. The number of sellers of butterfly products is 145 sellers. A total of 9 domestic regions and 30 countries made requests for Indonesian butterfly products

5.2. Recommendations

It is recommended that there is a need for conservation efforts and the use of butterflies that can support the welfare of the community. The creation of captivity, tourist parks and butterfly education, as well as training on the use of products from butterflies, can be a means of doing butterfly conservation efforts. The government needs to provide support and clear rules so that the use of butterflies is not exploited and its sustainability is guaranteed.

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