Journal of Natural Resources and Environmental Management
12(4): 679–688. http://dx.doi.org/10.29244/jpsl.12.4.679–688
E-ISSN: 2460-5824
http://journal.ipb.ac.id/index.php/jpsl

Supporting factors for javan langur rehabilitation management (*Trachypithecus auratus* E. Geoffroy, 1812) In Javan Langur Center Batu, East Java

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Article Info:
Received: 03 - 06 - 2022
Accepted: 08 - 08 - 2022

Keywords:
Javan langur center, management, rehabilitation

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Abstract. *The population of the Javan langur* (Trachypithecus auratus) *is currently decreasing, so the threat to the preservation of the Javan langur requires conservation efforts that are beneficial for conservation in nature. One of the conservation efforts is carried out ex-situ, such as the one at the research station at the Javan Langur Center. This study aims to determine the Rehabilitation management of Javan langurs at the Javan Langur Center. The method used in this research is the interview, field observation, and literature study. The use of strategic factor analysis (SWOT) is carried out in the management of Javan Langur rehabilitation which includes analysis of internal factors and external factors. The first rehabilitation management, namely the development strategy at the research site, is carried out through a rehabilitation program strategy. The second utilizes and maintains good support from the government. Third, utilize experienced human resources. Fourth, increase the number of health workers who are still lacking. Fifth, improve the quality and quantity of facilities and infrastructure. Sixth, add experienced human resources. Seventh, improving the quality and quantity of facilities at the Javan Langur Center*.

How to cite (CSE Style 8th Edition):
Ananda AN, Santoso N, Hernowo JB. 2022. Supporting factors for javan langur rehabilitation management (*Trachypithecus auratus* E. Geoffroy, 1812) In Javan Langur Center Batu, East Java. JPSL **12**(4): 679–688. http://dx.doi.org/10.29244/jpsl.12.4.679–688.

INTRODUCTION

Javan langur (*Trachypithecus auratus*) is one of Indonesia's endemic animals whose distribution is only on the islands of Java, Bali, and Lombok, which can be found in both primary and secondary forests, forest edges and forest interiors (Nijman and Balen 1998). In 2008, International Union for Conservation of Nature and Natural Resources (IUCN) categorized the Javan langur as vulnerable, which previously had an endangered status. Javan langurs are included in the Appendix II category (animals whose trade is restricted) in CITES. The population of Javan langurs continues to decline due to increasing forest destruction in their natural habitats, one of the factors that support habitat destruction due to the higher level of human demand for wood and land. This is exacerbated by the human desire to make the Langur (javan langur) as a pet.

The threat to the preservation of the Javan langur requires conservation efforts that are beneficial for the conservation of nature. In addition to in-situ conservation, which includes the protection of populations and their habitats, law enforcement, education, and awareness raising, ex-situ conservation is necessary because many Javan langurs are kept as pets. Ex-situ conservation of javan langurs is carried out in several zoos, which are generally used as collection animals. The risk of extinction of Javan langurs in natural habitats is increasing,

so ex situ conservation has begun to be developed in rescue and rehabilitation centers with the aim of returning ex-captive Javan langurs to their natural habitats (Leca *et al.* 2013). In accordance with the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia (KLHK) Number 22 of 2019, conservation agencies carry out the conservation of wild plants and animals outside their habitat (ex situ), both in the form of government and non-government institutions.

Javan Langur Center (JLC) is one of the ex-situ institutions that support efforts to conserve primates, especially the Javan Langur species. Located in JLC Batu, East Java. JLC is more specific with the Javan Langur (*T. auratus*) treatmeant and rehabilitation program. Since 2003 until now, efforts to rehabilitate Javan langurs have been carried out. Rehabilitation is the process of recovering individual animals that have been in captivity or healing animals from injuries or diseases before being returned to their natural habitat (Yeager and Sliver 1999). Rehabilitation efforts will continue to be carried out so that the extinction of Javan Langur can be prevented.

Efforts are being made to return a former pet primate not easy. These efforts cost a lot of money, and take a long time to be released into the wild. Before being released into the wild, careful consideration and preparation are needed to return to the wild nature because Javan langurs have a high level of sensitivity to disturbances. The success of the release of the Javan langur is very important. The adaptive behavior of each individual Javan langur is a benchmark in the success of releasing it to its natural habitat. Reintroduction is also intended to establish a population of one species of animal in a new location and utilize this main species to increase the conservation of selected forest areas effectively (Meijaard *et al.* 2001). Assessment of forest areas as release sites is important. The location must have a long-term carrying capacity and guaranteed safety.

Based on this, careful planning is needed in the release. Post-release monitoring needs to be carried out to ensure protection, certainty of adaptation, and ability to live in the wild, as well as for research needs. Although a series of post-release processes have been prepared, it is possible that things may not go as expected. The adaptability of rehabilitated Javan langurs and wild Javan langurs is certainly not the same. Changes in behavior can affect the adaptability of Javan langurs after being released into the wild. Habitat suitability and human presence factors are also the main things in a successful release. Ensuring that the implementation of the release goes according to expectations, needs to be done by analyzing internal and external factors that influence it with a SWOT analysis as a strategic design for the management and development of java langur rehabilitation activities. This research was conducted to determine the internal and external factors in the Javan Langur rehabilitation activities at the JLC so that the management strategy for the Javan Langur rehabilitation activities based on recognized internal and external factors can be formulated appropriately.

METHOD

Research Location and Time

The research was carried out from January to April 2021 at the Javan Langur Center Batu, East Java**.** The area is precisely located in Tulungrejo Sub Distric, Batu City, East Java. The JLC has an area 4 hectares. The JLC only specializes rehabilitating the Javan langur to be released into their natural habitat. An overview of the research location is presented in Figure 1.

Method of Collecting Data

The materials used are interview guidelines and tally sheets. Structured interviews were conducted to obtain data on management aspects, including the implementation of management functions consisting of planning, organizing, implementing, monitoring, and evaluating. Identification of strategic factors in the form of internal factors and external factors needs to be done so that the implementation of the captive management functions of the JLC can run well. Matrix External Strategic Factors Summary (EFAS) and Internal Strategic Factors Summary (IFAS) These factors consist of weights, column ratings, and total scores. Specifically, the

weight and rating columns are filled in according to the value, which is the result of grouping internal and external factors based on their importance. The data were then analyzed using Strengths Weaknesses Opportunities and Threats (SWOT) analysis.

SWOT analysis is the identification of various factors systematically used to formulate the strategy of an institution. This analysis is based on a logic that can maximize strengths and opportunities while simultaneously minimizing weaknesses and threats. According to Rangkuti (2006), this analysis is based on the assumption that an effective strategy will maximize existing strengths and opportunities and minimize weaknesses and threats. When applied accurately, these simple assumptions have a huge impact on the design of a successful strategy, and the analysis of an institution provides the information needed to identify opportunities and threats that lie within an institution. The data collection carried out in this study consisted of primary data and secondary data. The type of primary data presented is data collected directly in the field which is used for data processing. This data includes data on the conservation of Javan langurs, the success rate of captive breeding, and the release of Javan langurs in natural habitats. Secondary data is data supporting research results obtained from various related sources. This data includes langur bioecology and captive-related data.

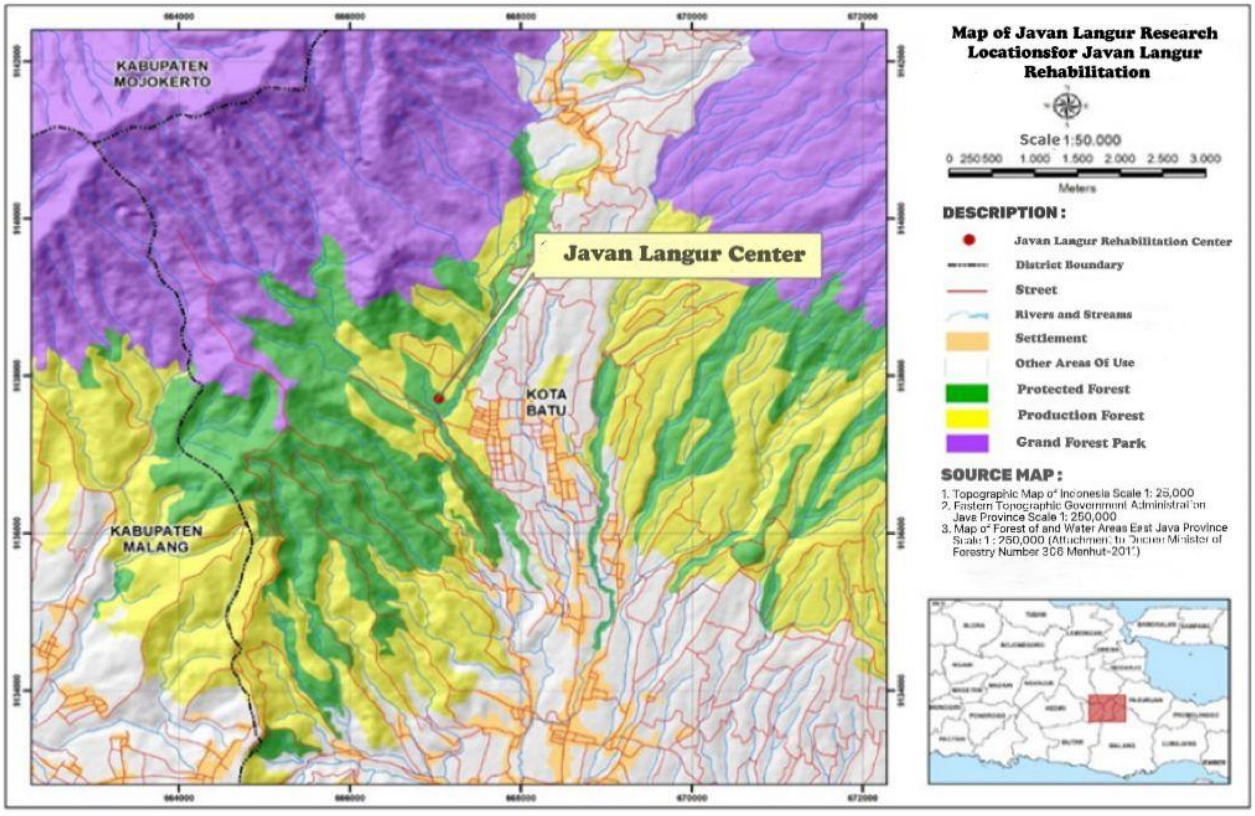

Figure 1 Research location

Data Analysis

Analysis of animal conservation is carried out by means of strategic factor analysis (SWOT), which includes internal analysis and analysis of external factors (Rangkuti 1997). Internal factor analysis was carried out using an internal strategic factor analysis matrix (IFAS), while external factor analysis used an external strategic factor matrix (EFAS). The type of data used in this study is qualitative data. Qualitative data is data that is expressed in the form of numbers or with data that is presented in the form of words that contain meaning (Noor 2014). Qualitative data in this study is in the form of data from interviews, notes in the field, and official documents. After that, the data is collected and then processed and explained according to the data. Descriptive

(qualitative) assessment, which includes collecting data to test hypotheses or answer questions about the latest status of the research subject. Descriptive data were collected through a list of questions in surveys, interviews, or observations (Kuncoro 2003).

The data used comes from two sources, namely secondary data and primary data. Primary data is data collected by someone directly from the object under study and for the benefit of the study concerned, which can be in the form of interviews and observations (Situmorang and Lutfi 2012). Primary data are the results of interviews and observations regarding research at the Java Langur Rehabilitation Center, then secondary data is data obtained and collected from previous studies published by various other agencies (Situmorang and Lutfi 2012). The secondary data in this study were in the form of documents and literature. The data collection techniques used to obtain data in this study were observation, interviews, and questionnaires. Collecting data in this study using questionnaires to the parties concerned. The data analysis method used in this research is descriptive with a qualitative approach. The method used is to analyze the company's internal (strengths and weaknesses) and external (opportunities and threats) environment which is the basis for conducting a SWOT analysis.

Table 1 External strategic factors (External Strategic Factors Analysis Summary)

External strategic factors	**Weight**	**Rating**	**Score (weight x rating)**
Opportunity			
Opportunity 1	Opportunity Wight 1	Opportunity Rating 1	
Opportunity 2	Opportunity Wight 2	Opportunity Rating 2	
Amount	A		B
Threat			
Threat 1	Threat wight 1	Threat Rating 1	
Threat 2	Threat wight 2	Threat Rating 2	
Amount	C		D
Total	(A+C)		(B+D)

Source: Rangkuti (2006)

Table 2 Internal strategic factors (Internal Strategic Factors Analysis Summary)

Internal strategic factors	**Weight**	**Rating**	**Score (weight x rating)**
Strenght			
Strenght 1	Strenght Weight 1	Strenght Rating 1	
Strenght 2	Strenght Weight 2	Strenght Rating 2	
Amount	A		B
Weakness			
Weakness 1	Weakness Weight 1	Weakness Rating 1	
Weakness 2	Weakness Weight 2	Weakness Rating 2	
Amount	C		D
Total	(A+C)		(B+D)

Source: Rangkuti (2006)

SWOT analysis is carried out through a matrix of internal strategic factors (IFAS), which outlines the strengths and weaknesses of an institution, and a matrix of external strategic factors (EFAS), which outlines the opportunities and threats that arise. Owned by an institution and the IE (Internal External) matrix, which shows an institution's position currently. The stages of compiling the IFAS matrix, EFAS matrix, and SWOT

analysis are presented in Table 1 and 2. The results of interviews conducted with management related to captive conditions and captive development were carried out to determine the weight and rating. The result of the weighting score is calculated by multiplying the weight by the branch. The results of interviews conducted with management related to captive conditions and captive development were carried out to determine the weight and rating (Meizannur and Wulandari 2015). Then, the weighting score is calculated by means of the weights times the rating. Based on the results of the weighting score, then, it is used to determine the development strategy.

RESULT AND DISCUSSION

Identification and Assessment of Internal and External Factors

Management development strategy indentifies the assessment of internal factors and exernal factors. Identification, classification, and weighting of Internal Factors are diveided into two, namely weaknesses and strengths. External Factors are also divided two, namely opportunities and threats. The development of Javan Langur rehabilitation at the JLC is presented in Table 3.

Table 3 Analysis of Internal Factors (IFAS) and External Factors (EFAS) Development of Javan Langur Rehabilitation at JLC

No.	IFAS Strength/S	Weight	Rating	Score
1.	Efforts to add electricity every year	0,10	5	0,5
2.	Anticipating an experienced workforce	0,25	8	2,0
3.	There is a temperature control in the clinic room	0,25	8	2,0
	Total	0,60		4,5
No.	**IFAS Weakness/W**	**Weight**	**Rating**	**Score**
1.	Resident health workers are not yet at the Rehabilitation site	0,10	3	0,3
2.	The area/place of the Rehabilitation Location is quite cold	0,05	2	0,1
3.	Electricity is still lacking	0,20	8	1,6
4.	Inadequate team/SDM	0,05	1	0,05
	Total	0,40		2,05
	EFAS Opportunity/O	**Weight**	**Rating**	**Score**
1.	Local community support	0,20	8	1,6
2.	There is support (Supporting) funds from the central government through KLHK	0,05	1	0,05
3.	The object of research and development of science	0,20	8	1,6
	Total	0,45		3,25

No.	EFAS Threats/T	Weight	Rating	Score
1.	Langur conditions that enter the JLC vary (health conditions)	0,10	7	0,7
2.	Looking for release alternatives	0,35	8	2,8
3.	Hunting efforts in release areas	0,10	3	0,3
	Total	0,55		3,8

*Total IFAS Weight= 1,00; Total EFAS Weight = 1,00

Based on the results of the study, it can be seen in Table 3 shows the total score of strength assessment at the research location at the JLC is 4,5, with the highest strength, namely anticipating experienced workers and the presence of temperature control in the health room with a score of 2,0. The workers or keepers at the JLC are very experienced in handling the treatment of langurs. The JLC is a location that has a fairly cold temperature. Therefore, in the clinic room, a temperature controller is provided to maintain the temperature in the room if there are unwell Javan langurs. The total score for the assessment of weakness is 2,05, with the highest weakness, namely the lack of electrical power, which is 1,6. Electrical power at the JLC is still lacking, therefore, additional electrical power is still being carried out until now. According to Tumiran (2002), electrical energy can be produced in various ways from different initial sources, namely water, oil, gas, coal, wind, sunlight, geothermal, and others.

Based on the research results, the total scoring opportunity in Table 3 is 3,25, with the highest opportunity, namely the support of the surrounding community and the object of research and scientific development 1,6. Based on the results of the search for the location of the Javan Langur Rehabilitation Center with community activities, it is fairly close. However, this does not disturb the community with the rehabilitation activities of the surrounding community supporting the rehabilitation of the Javan Langur. Then, the location of the JLC is also very good for the research and development of science from kindergarten to university students. The total score on Threat is 3,8, with the highest threat, namely seeking alternative release locations, as much as 2,8. Release activities at the JLC are still trying to expand the search for release locations, this is due to the large number of Javan langurs that will be released every year and to avoid illegal hunting of released langurs. According to Irawan (2012) that the methods of escape also vary, with some being shot or poisoned and even traps (snares) being set by the local community. The search for release locations continues to this day. The release location was also assisted by TAHURA (*Taman Hutan Raya*) in providing the release location.

Javan Langur Location Development Strategy

Based on the weighting results presented in Table 3, the strength factor gets a score of 4,5, and the weakness factor gets a score of 2,05, so the difference between strengths and weaknesses is 2,45. The comparison is relatively small if it is not maximized with the current strengths, which results in weaknesses that can be higher and affect the development process. The opportunity factor has a score of 3,25, and the threat factor has a score of 3,8, so it has a score of –0,55. Based on the weighting results in Table 14, a SWOT diagram is then made by giving positive values for strengths and opportunities and negative values for weaknesses and threats, as shown in Figure 2.

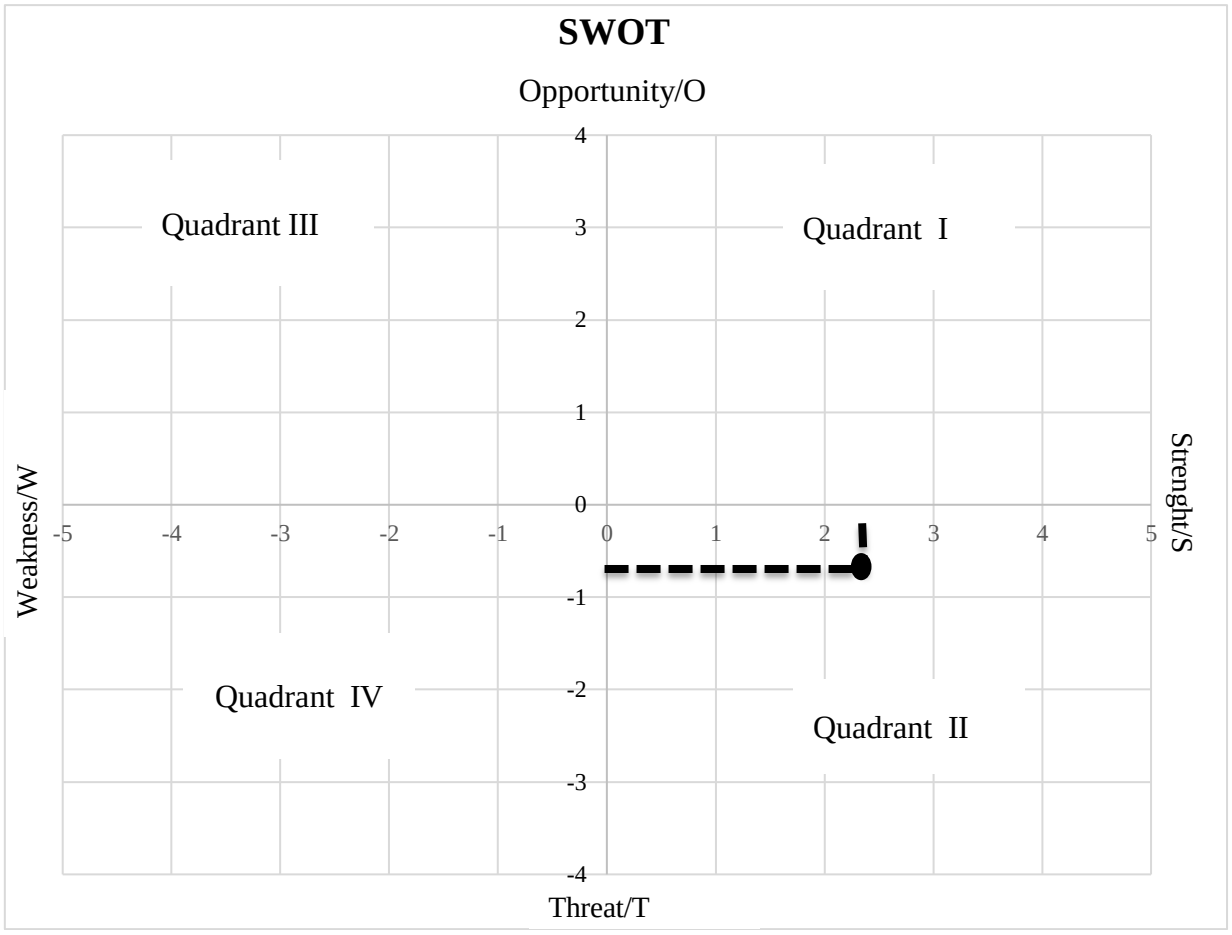

Figure 2 SWOT diagram

Quadrant (I) is a very favorable situation because the Rehabilitation activities at the JLC have opportunities and strengths, but these opportunities must be utilized. Quadrant (II) is an activity that has threats but still has strength from internal factors, so existing opportunities and activities must be maximized, including adding sources of revenue. Quadrant (III) This Rehabilitation Activity has a very large opportunity, but on the other hand, it has several weaknesses from internal factors, so efforts must be made to minimize internal problems to focus on seizing opportunities. Quadrant (IV) is a very risky and very detrimental situation because the Javan Langur Rehabilitation activities face threats as well as internal weaknesses. Based on the results in Figure 2, a SWOT analysis matrix and development strategy for the Javan Langur Rehabilitation are drawn up, as shown in Table 4.

Table 4 SWOT Analysis matrix and strategy for captive development of javan langurs at JLC

IFAS / EFAS	**Strenght/S**	**Weakness/W**
	1. Efforts to add electricity every year	1. Rehabilitation of the resident health workers is not yet at the rehabilitation site
	2. Anticipating experienced workforce	2. Areas/places of Rehabilitation Locations that are quite cold
	3. There is a temperature controller in the clinic room	3. Electricity is still lacking
		4. Insufficient team/SDM

Opportunity/O	SO Strategy	WO Strategy
1. Support from the surrounding community 2. Supporting funds from the central government through the Ministry of Environment and Forestry 3. The object of research and development of science	1. Utilize cooperation and support and program integration between local government, central government, community and private parties, financially and policy (S1.03, O1.2) 2. Utilize experienced and scientific human resources to improve knowledge and technology (S2.O3)	1. Improving health workers and human resources to facilitate the handling of animal health 2. (W1.04, O1.02) 3. Improving the quality and quantity of supporting facilities and infrastructure at the rehabilitation site 4. (W1.02, O1.02.03)
Threat/T	**ST Strategy**	**WT Strategy**
1. The condition of the Langur entering the JLC varies (health condition) 2. Looking for release alternatives 3. Hunting efforts in release areas	1. Add and improve experienced human resources (S1.2.3, T1.02.03)	1. Make efforts to increase experienced human resources as well as adequate facilities and infrastructure to anticipate and protect the health of the Javan Langur and the natural habitat ecosystem to prevent threats. (W1.02.03.04, T1.02.03)

Preparation of Alternative Search Location Development Strategies

SO strategy is a strategy that uses internal strengths to take advantage of external opportunities. WO strategy aims to be used to improve internal weaknesses by taking advantage of external opportunities. ST strategy uses strength to avoid or reduce the impact of external threats. While WT is a direct defensive strategy to reduce internal weaknesses and external threats (David 2011).

SO Strategy (Strength-Opportunity)

The S-O strategy is one of the strategies used by utilizing all existing strengths to be able to take advantage of all the opportunities they have (Hastanti *et al.* 2009). The strategy that can be applied to the Javan Langur Rehabilitation Center is to increase the strength of human resources by responding to existing opportunities by adding experienced human resources. JLC can use strengths such as establishing cooperation and maintaining support and program integration between local governments, central government, communities, and the private sector, both financially and policy. With support from outsiders, the rehabilitation program can run well. According to Nugroho *et al.* (2013), it is stated that strong government support is support in cooperation with various organizations or institutions.

WO Strategy (Weakness-Opportunity)

This strategy can overcome weaknesses by taking advantage of opportunities. With this strategy, it is hoped that JLC can improve existing weaknesses. Strategies that can be applied are Improving health workers and human resources. There is only one health worker at the JLC who lives in Bandung, so it takes time to

visit the JLC, but there are no doctors specifically available at the JLC. Human resources at JLC are experienced, but they still need veterinarians, so it is necessary to add health workers, such as veterinarians who reside at JLC, in order to facilitate quick medical treatment at JLC. It is necessary to improve the quality and quantity of supporting facilities and infrastructure at the rehabilitation site.

ST Strategy (Strength-Threats)

This strategy is a strategy that uses strength to fill the threat column, this strategy is used to avoid or reduce the impact of external threats (Ramadhan 2013). The strategy that can be used is to add and improve experienced human resources. According to Imran (2012), A person's experience in caring for animals has a positive effect on the welfare of these animals. This aims to deal with the threats faced, such as special handlers if the Langur to be rehabilitated a disease, besides looking for alternatives to release and poaching also requires experienced experts to prevent poaching. Therefore, at the JLC it is necessary to add at least 1 (one) human resource, namely a veterinarian, to facilitate the existing Rehabilitation program at the JLC and 2 to 3 additional resources specifically for handling illegal hunting prevention (monitoring).

WT Strategy (Weakness-Threats)

WT strategy is a strategy that minimizes weaknesses in order to avoid threats. Strategies that can be applied at the JLC are efforts to increase experienced human resources as well as adequate facilities and infrastructure to anticipate and protect both the health of the Javan Langur and the natural habitat ecosystem so as to prevent threats from occurring, such as poaching. According to Soehartono and Mardiastuti (2003) In the beginning, hunting for wildlife was only intended to fulfill the community's need for protein. Then it turns into a buying and selling activity to get cash from other parties. This can threaten the existence of protected animals.

CONCLUSION

Strategy (1) development at the research site is carried out through a rehabilitation program strategy. Strategy (2) utilize and maintain good support from the government. Strategy (3) utilize experienced human resources. Strategy (4) to increase the lack of health workers. Strategy (5) to improve the quality and quantity of facilities and infrastructure. Strategy (6) experienced human resources. Strategy (7) improving the quality and quantity of facilities at the JLC.

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