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THE IMPACT OF THE COVID-19 PANDEMIC ON THE MANAGEMENT OF THE SUMATRAN TIGER (*panthera tigris sumatrae pocock*) IN CONSERVATION INSTITUTIONS FOR THE PUBLIC INTEREST

(CASE STUDY AT TAMAN SAFARI INDONESIA CISARUA BOGOR AND RAGUNAN WILDLIFE PARK JAKARTA)

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Abstrak. The World Health Organization (WHO) as a world health institution declared COVID-19 as a global pandemic on March 11, 2020 and Indonesia officially announced a confirmed case of COVID-19 infection on March 2, 2020. One of the tourist attractions affected by COVID-19 is the Conservation in the Public Interest such as safari parks, zoos and animal parks. This study aims to: analyze the management of the Sumatran Tiger in the Indonesian Safari Park Cisarua Bogor and the Ragunan Wildlife Park during the COVID-19 pandemic, analyze the steps to minimize the impact of the COVID-19 pandemic on the management of the Sumatran Tiger at the Indonesian Safari Park Cisarua Bogor and the Ragunan Wildlife Park. and formulate a strategy for managing the Sumatran Tiger in the face of a disease pandemic in the Indonesian Safari Park and Ragunan Wildlife Park. The research method used is descriptive research method. The source of research data comes from primary data sources, namely the management of the Indonesian Safari Park Conservation Agency Cisarua Bogor and Ragunan Wildlife Park and secondary data sources obtained from literature studies. The data taken are the management of the Sumatran tiger in the Cisarua Bogor Indonesian Safari Park and the Ragunan Wildlife Park and the types of use of the Sumatran tiger in the Cisarua Bogor Indonesian Safari Park and Ragunan Wildlife Park. Field observations were carried out to photograph and directly collect data on the condition of the Indonesian Safari Park Conservation Institute, Cisarua Bogor and Ragunan Wildlife Park, and the management of the Sumatran Tiger which includes aspects of management, manpower handling animals, and utilization and documentation studies. Processing of data from observations, interviews and documentation studies using descriptive qualitative analysis, and SWOT analysis. Based on the results of the study, that the operational management of the Sumatran Tiger at the Taman Safari Indonesia Cisarua Bogor and the Ragunan Wildlife Park runs in accordance with the rules of animal management applied at the Conservation Institute for the Public Interest even though the COVID-19 pandemic has affected the income generated from visitor entrance tickets, especially for Taman Safari Indonesia Cisarua Bogor. The implication of this research is to minimize the impact of the COVID-19 pandemic on the operational management and protection of Sumatran Tigers in the Conservation Institute for the Public Interest, the government, together with the Indonesian Zoo Association and the managers of the Conservation Institute for the Public Interest, need to immediately draw up an emergency management plan. animals, especially the Sumatran Tiger, while still being guided by aspects of animal welfare and compiling Standard Operating Procedures to prevent the spread of COVID-19.

Keywords: the Covid-19 pandemic; management; Sumatran tiger; Conservation Society

I. INTRODUCTION

Wild Sumatran tiger (*Panthera tigris sumatrae*) lives in the remaining forests on the Sumatra island (Patana et al., 2021 **[1]**), but they choose a landscape which dominated by natural vegetation cover as their main habitat (Priatna et al, 2012 **[2]**; Priatna, 2020 **[3]**). Research on the management of Sumatran tigers in Ragunan Wildlife Park (*Taman Margasatwa Ragunan - TMR*) was conducted by Whita Sabrina Kusuma Putri in 2018. This study examines the management of Sumatran tigers, calculates feed consumption, and examines the eating behavior of Sumatran tigers. Sumatran Tiger maintenance management is carried out with an intensive system, namely all technical aspects of maintenance are planned and carried out by TMR managers. The male Sumatran tiger consumes 4.61 kg/day/individual daily feed, the female consumes 3.86. daily feed kg/day/individual **[4]**. Based on the results of the study, the Sumatran Tiger's feed requirements at TMR were less than optimum based on body weight, protein and taurine requirements while the energy requirements were sufficient **[5]**. Based on this, a new variety of feed is needed to increase the amount of feed containing lower calories, increasing the need for protein and taurine which is insufficient **[6]**. The recommendation in this study is to increase the amount of feed to match the body weight of the Sumatran tiger, which is to increase the number of chicken and beef but reduce the amount of wild boar meat **[7]**.

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The Sumatran tiger (*Panthera tigris sumatrae Pocock*) is the largest carnivorous mammal and the last tiger sub-species after the extinction of the Bali tiger (Panthera tigris balica) and the Javan tiger (Panthera tigris sondaica) that are still living in Indonesia, which are included in priority animals that must be increased in their habitat. nature (KHLK **[8]**). Based on Government Regulation no. 7 of 1999, the Sumatran tiger is included in the category of protected animals. In addition, the Sumatran tiger is included in the CITES Appendix I category. (Convention on International Trade in Endangered Species of Wild Flora and Fauna) and is prohibited to be traded in any form **[9]**.

The decline in the population and conservation status of the Sumatran Tiger requires both in-situ and ex-situ conservation. Public Conservation Agency (*Lembaga Konservasi Umum - LKU*) that carry out Sumatran tiger conservation include the Indonesian Safari Park (*Taman Safari Indonesia - TSI*) Cisarua Bogor and TMR **[10]**. TSI Cisarua Bogor is the largest zoo in Indonesia which was founded in 1980 and is managed by PT. Taman Safari Indonesia while TMR is one of the largest zoos in Indonesia which is managed by the Regional Public Service Agency (*Badan Layanan Umum Daerah - BLUD*) and was established in 1864 **[11]**. Based on the data of the 4th quarter of the information system and conservation data (*Sistem Informasi dan Data Konservasi* - SIDAK) of the Directorate General of Conservation of Ecosystem Natural Resources (*Konservasi Sumber Daya Alam Ekosistem - KSDAE*) in 2018 the number of animals there are 31 individuals in TSI Cisarua Bogor, while in TMR there are 27 individuals **[12]**. Almost all zoos have lost their income since closing in March 2020. The Association of Indonesian Zoos (*Perhimpunan Kebun Binatang Se-Indonesia - PKBSI*) recommends that tigers in zoos should reduce their feed rations, use cheaper alternative feeds and be fasted several times a week because zoo managers find it difficult to provide eating animals during the COVID-19 pandemic (BBC Indonesia **[13]**). (OIE) The World Organization for Animal Health in 2020 issued guidelines for handling mammals during the COVID-19 pandemic, that the principles of handling animal care during COVID-19 are biosecurity and hygiene as well as the precautionary principle in preventing the transmission of COVID-19 from humans to animals **[14]**.

The choice of research location is based on the unavailability of studies regarding animal management during the COVID-19 pandemic. The study of Sumatran tiger management in LKU is an important parameter to determine animal management during the COVID-19 pandemic. Sumatran tiger management has a higher cost and is the main attraction at LKU compared to other animals. Knowledge of animal welfare (animal welfare), labor and the use of animals in zoos is an important component to determine the level of animal welfare based on the Regulation of the Director General of Nature Protection and Conservation Number: P.9/IV-Set/2011 concerning Guidelines for Ethics and Animal Welfare in Conservation Institutions **[15]**. Based on this thought, it is necessary to conduct research on the impact of the COVID-19 pandemic on the management of Sumatran tigers in conservation institutions, especially in LKU. Indonesia has three sub-species of tigers, namely the Javan tiger (Panthera tigris sondaica), the Bali tiger (Panthera tigris balica), and the Sumatran tiger (Panthera tigris sumatrae Pocock). Two of them were declared extinct, namely the Javan tiger which became extinct in the 1940s and the Bali tiger which became extinct in the 1980s (Seidensticker **[16])** Currently, the population of Sumatran tigers in the wild is estimated at around 600 individuals scattered on the island of Sumatra (Forum Harimau Kita **[7]**). The decline in the Sumatran tiger population is caused by forest conversion, habitat degradation, tiger-human conflicts, and tiger hunting and food in their natural habitat **[17].**

The existence of the Sumatran Tiger in the Conservation Institute for the Public Interest is a form of ex-situ conservation in support of conservation efforts in its natural habitat. Based on the Strategy and Action Plan for Sumatran Tiger Conservation for 2007-2017, the number of Sumatran tigers in ex-situ conservation institutions in the country is 129 individuals, while those found abroad through the mechanism of lending (breeding loan) and animal exchange are 265 individuals. spread across North America, Europe, Australia and Japan (Forum Harimau Kita **[7]**).

In Indonesia, there are 81 (eighty one) units of LKU, 55 (fifty five) units of which are members of PKBSI. Since the official announcement from the Government regarding confirmed cases of the COVID-19 pandemic in early March 2020, the government has implemented a policy of closing all facilities that have the potential to cause new clusters of COVID-19 spread, including LKU. Based on a survey by PKSBI, 92% of zoos in Indonesia are only able to provide feed for the next 3 months since closing due to the COVID-19 pandemic **[18]**.

This research aims to Analyzing the management of the Sumatran Tiger at TSI Cisarua Bogor and TMR during the COVID-19 pandemic. Analyzing efforts to minimize the impact of the COVID-19 pandemic on the management of Sumatran Tigers at TSI Cisarua Bogor and TMR. Formulate the Sumatran Tiger management strategy in dealing with the disease pandemic in TSI Cisarua Bogor and TMR

II. RESEARCH METHODS

Sources of research data come from primary data sources and secondary data sources. The primary data source is the manager of the TSI Cisarua Bogor Conservation Agency and TMR which consists of the management section consisting of Field Managers and field officers who handle Sumatran Tiger animals consisting of Animal Keepers (Keeper), Veterinarians, Curators, Nutritionists and data from field observations. Secondary data sources are used to support research obtained from literature studies. The data taken are the management of Sumatran tigers in TSI Cisarua Bogor and TMR and types of utilization of Sumatran tigers in TSI Cisarua Bogor and TMR.

Data collection techniques that will be used are Interviews were conducted freely, in-depth, casually and openly using interview question guidelines **[19]**. In addition,

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to obtain more extensive information related to the management of the Sumatran Tiger, questions were developed to obtain the required data. The selection of the interviewees was determined intentionally (purposive sampling) with consideration of the mastery of information on the research subjects. Field observations were carried out to photograph and directly collect data on the condition of the TSI Cisarua Bogor Conservation Institute and TMR, and the management of the Sumatran Tiger. Field observations were carried out in the morning until the afternoon starting at 08.00-16.00 WIB.

Data collection as follows Aspects of Sumatran tiger management include: Condition of the cage including size, type and shape of the cage, intensity; Feed quality conditions include the type, frequency, composition, amount and variety of feed; Animal health includes the provision of vitamins, medicines, routine check-ups, disease management and medical facilities. Manpower handling Sumatran Tiger animals in the form of: Number of workers, Division of working hours Time of working hours, Employee Education Capacity building. Utilization of the Sumatran Tiger in the form of Demonstration of animals while in exibit cages and demonstrations in display cages, Controlled breeding.

Documentation studies were conducted to collect, explore, review, and study related documents regarding aspects of Sumatran tiger management in LKU. These documents are in the form of reports, scientific articles, books, theses, theses, and other scientific works. At the Data Analysis stage, data processing is carried out from the results of observations, interviews and documentation studies using an analysis that is in accordance with the needs of each data. The analysis used is descriptive qualitative analysis, and SWOT analysis.

III. RESULTS AND DISCUSSION

Sumatran Tigers at TSI Cisarua Bogor and TMR

The management of Sumatran tigers at TSI Cisarua Bogor and TMR has the main function as a controlled breeding site while maintaining the purity of its species and other functions as a place of education, demonstration, temporary care, a source of broodstock and genetic reserves to support in-situ populations, recreational and research facilities and science development. The population of Sumatran tigers in TSI Cisarua Bogor amounted to 21 individuals with details of 11 males and 10 females, and in TMR there were 26 individuals consisting of 12 males and 14 females. Based on the composition of the sex ratio of the Sumatran Tiger, both in TSI Cisarua Bogor and TMR have a ratio of 1.1 : 1. This shows that the conservation of Sumatran tigers through controlled mating in conservation institutions has a great opportunity to support the link to insitu ex-situ program. Each individual has an age, origin, and is placed in a different location and type of cage.

The Sumatran tigers managed by TSI Cisarua Bogor and TMR come from government custody, acquisitions from other conservation institutions and the results of controlled marriages. Based on the research above, it shows that there are 12 Sumatran tigers in TSI Cisarua Bogor that are the result of controlled marriages and 9 individuals who are the result of government custody originating from illegal hunting (poaching) and submission from the community. While the Sumatran tigers managed by TMR are mostly the result of controlled marriages of 24 individuals and 2 individuals came from the acquisition of Medan Zoo. The acquisition of Sumatran Tigers from other conservation institutions is intended to obtain new blood (fresh blood) with the aim of improving genetics and avoiding inbreeding, considering that 92.30% of Sumatran Tigers are born in TMR. According to the Minister of Forestry Regulation Number: P.63/Menhut-II/2013, it is stated that the controlled breeding of wild plants and animals in ex-situ habitats maintains species purity and refers to collection management **[20]**.

Most of the Sumatran tigers in TSI Cisarua Bogor and TMR are in good condition, but there are several Sumatran tigers that are disabled. There are 4 deformed Sumatran tigers in TSI Cisarua Bogor which are the result of rescue due to conflict and poaching. In nature, tigers are under very high pressure as a result of habitat loss (Priatna et al, 2020 **[3]**, and high levels of hunting for trade (Shepherd & Magnus **[21]**). Most of the Sumatran tigers have deformities in the legs, which are thought to be due to slings. The Sumatran tiger named Giring has a defect in the hoof of his right forefoot, Salamah's front scapula has been amputated due to rot, Dara of the fingers to the sole of the foot is absent, Siti Emat is missing the middle finger of the left forefoot

Based on the age structure of sexual maturity, female Sumatran tigers are around 3 to 4 years old, while male tigers are 4 to 5 years old **[16]** results. shows that Sumatran tigers have an age range of 3 to 21 years. In nature, tigers have a life expectancy of 12 to 15 years **[22]**. There are 11 individual tigers over 15 years old. This shows that tigers living in conservation institutions have a longer life expectancy than in the wild. This is in accordance with the results of Karanth's **[22]** study which states that the life expectancy of a tiger ex-situ can reach more than 20 years. Factors that affect the life expectancy of ex-situ tigers are the availability of feed, health care, and the absence of competitors.

Sumatran Tiger Management during the pandemic

Sumatran tiger management consists of managing cages, feed, health, labor and their use in ex-situ habitats. Data collection was done by field observations, interviews and literature studies.

Feed Management

Feeding for animals managed ex-situ must have good quality and quantity to meet the nutritional needs and palatability of animals. Good feed will affect the health of the animals that are kept. In addition, the type of feed given must be adapted to the feed of animals that live in nature. Generally, Sumatran tiger prey in nature is wild boar, deer, and sometimes poultry and fish (Sriyanto and Rustiati **[23]**). Aspects of feed management in TSI Cisarua Bogor and TMR.

SWOT analysis

The formulation of the Sumatran Tiger management strategy at TSI Cisarua Bogor and TMR were analyzed using

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SWOT (Strengths, Weaknesses, Opportunities and Threats). The SWOT analysis was carried out by comparing the internal factors of the TSI Cisarua Bogor manager and TMR consisting of strengths and weaknesses and external factors originating from outside the management of TSI Cisarua Bogor and TMR consisting of opportunities and threats. with qualitative and quantitative data methods. The stages in the SWOT analysis approach are identification of internal and external factors, making Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices, making Internal-External (IE) matrix, SWOT matrix, and ranking alternative strategies. Collecting data on internal and external factors. Internal factors were obtained through the identification of strengths and weaknesses related to the management of Sumatran Tigers in TSI Cisarua Bogor, external factors obtained all opportunities and threats originating from outside TSI Cisarua Bogor.

IFE and EFE Matrix Creation

The results of the Internal Factor Evaluation (IFE) were obtained from the results of the questionnaire assessment given to 10 respondents who were not from the management element of TSI Cisarua Bogor who had knowledge of Sumatran tiger management. Respondents consisted of 5 employees of the Ministry of Environment and Forestry which consisted of 1 Head of Exitu Preservation Section, 3 PEH, 1 Exitu Preservation Section staff and 5 PKBSI members. The value of the External Evaluation Factor (EFE) was obtained from the results of filling out the questionnaire given to 14 respondents from the management element of TSI Cisarua Bogor who were directly related to the management of the Sumatran Tiger which consisted of 1 Curator, 1 Assistant Curator, 1 Veterinarian, 1 person Public Relations section, 3 Head Keepers and 7 Keepers. Making Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices by multiplying the value of the weighting with the rating value from the results of the assessment of each internal and external factor.

Cartesian Diagram SWOT Analysis

The results of the IFE analysis obtained a positive internal value of 0.537 which would be projected on the X axis and the results of the EFE analysis obtained a negative external value of -0.03 which would be projected on the Y axis. In Figure 4.5 the SWOT Diagram of the Cisarua Bogor TSI is presented.

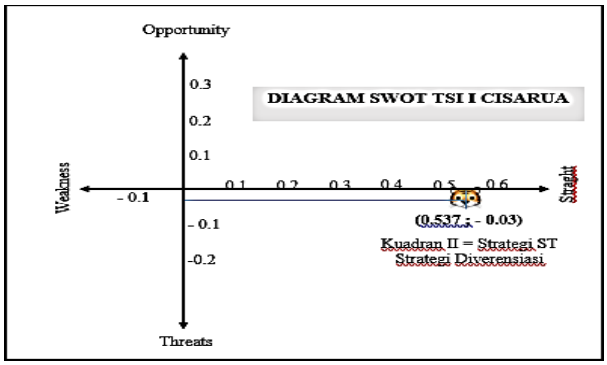

Figure 1. TSI I Cisarua SWOT Diagram

Based on the results of the IFE and EFE analysis above, the management of the Sumatran Tiger TSI Cisarua Bogor is in a quadrant II position where internal factors have positive values and external factors have negative values. This indicates that despite having threats in the management of Sumatran Tigers during the COVID-19 Pandemic, TSI Cisarua Bogor has internal strengths. The strategy that must be applied in this position is a diversification strategy where TSI Cisarua Bogor must use its internal strengths to take advantage of opportunities in the long term.

SWOT Matrix

After knowing the strategic position in the management of the Sumatran Tiger at TSI Cisarua Bogor, then an alternative strategy formulation was carried out using internal strength factors to take advantage of opportunities and overcome threats and minimize weaknesses by taking advantage of opportunities and overcoming threats.

Strategy Alternative Ranking

The ranking is done by adding up the scores for each strategic factor, a high score indicates that the strategy is more prioritized than a low score. The following ranking alternative strategies for Sumatran tiger management at TSI Cisarua Bogor.

Identification of TMR's Internal and External Factors

Identification of internal factors (strengths and weaknesses) related to the management of Sumatran Tigers in TMR. The explanation of each internal factor is as follows:

1. Strengths

1) Have a proportional Sumatran tiger

TMR has 26 Sumatran Tigers with a composition of 12 males and 14 females, it is very possible to carry out controlled breeding of Sumatran Tigers.

2) Entrance tickets are affordable for all levels of society

The ticket price for TMR is IDR 3,000 for children and IDR 4,000 for adults. Entrance ticket to Schmutzer Primate Center aged 3 years and over weekdays Rp.6.000, - and Rp. 7,500,- weekend Rates for vehicle parking range from Rp.1,000, - - Rp.15,000,-/day, rates for use of rides/fauna facilities start from Rp.2,500,- to 15,000,-. TMR is one of the cheap tourist destinations that provides educational facilities for various kinds of animals from within the country and abroad. The ticket price for Ragunan is cheaper than other animal parks in Jakarta such as Sea World at Taman Impian Jaya Ancol, Bird Park at Taman Mini Indonesia, and Jakarta Aquarium Indonesia (JAI).

3) Location is easy to reach

The location of TMR is in the city of Jakarta which is easy to make TMR a favorite tourist choice for the people of Jakarta and its surroundings.

4) Received financial support from the DKI Jakarta Government for animal management

Approximately 70% of the budget for animal management at TMR related to the procurement of feed, medicines and procurement for animal management is accommodated by funds originating from the Jakarta Regional Budget.

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5) Have adequate facilities and infrastructure as well as human resources

TMR has 3 locations for managing Sumatran tiger cages and in each location the human resources that directly handle Sumatran tigers are 8 keepers to handle 26 Sumatran tigers supervised by 5 veterinarians and food mixers which are very possible to carry out controlled breeding of Sumatran tigers

6) Have a wide network of cooperation

TMR is under the management of the BLUD of the City Parks and Forests Service so that it has an extensive coordination network. In addition, TMR is a member of PKBSI and is a member of GSMP for Tigers and has opened access to animal management cooperation with Overseas Zoos.

2. Weaknesses

1) Reduction of working hours of employees/managers

During the COVID-19 pandemic, Keeper's working hours started at 07.00 – 14.30 for 6 days/week, there was a reduction in working hours per day for 1 hour, which resulted in reduced monitoring of Sumatran Tigers and a shift in eating patterns.

2) SOP for Sumatran Tiger management during the COVID-19 pandemic.

There is no SOP for Sumatran Tiger management at TMR still using the old SOP yet adjusting to the COVID-19 pandemic situation

3) Cages and supporting facilities are poorly maintained and unattractive.

Operational funds for cage maintenance are allocated from ticket sales funds and other businesses managed by TMR, with reduced visitors resulting in cages and supporting facilities such as guardrails between cages and visitor areas being poorly maintained as well as animal information board

4) Storage space for limited feed stock

The refrigerator to provide Sumatran Tiger feed at TMR is only able to contain feed supplies for 2 weeks, it is feared that with this pandemic the distribution of feed will be disrupted due to restrictions on activity and distribution of feed because it is procured from third parties.

5) Limited Sumatran Tiger Demonstration The Sumatran Tiger.

Show only shows the Sumatran Tiger's activities around the cage and does not provide a special demonstration (Edutaiment) that explains more
education related to the Sumatran Tiger to TMR visitors.

6) Capacity building for limited human resources Keeper,

TMR medical personnel during the COVID-19 pandemic never participated and did not receive training or scientific capacity building related to the management of the Sumatran Tiger.

While the identification of external factors obtained all opportunities and threats originating from outside TSI Cisarua Bogor. The explanation of each external factor is as follows:
Opportunities

1) Selected tourist attraction that people are interested in TMR has a large area

A beautiful environment so that in the midst of the COVID-19 pandemic it is still a place for people to visit, because they can still feel the coolness of the outdoors in the middle of Jakarta.

2) Opportunity to obtain donations or assistance from other parties

At the beginning of the COVID-19 pandemic, PKBSI raised funds for animal feed and many people made donations for the purchase of animal feed.

3) Opportunity to implement Virtual Visits

Visitors The development of visits carried out by TMR through virtual is in demand by the community, especially school children who carry out online teaching and learning activities and one of the virtual visit objects offered is natural behavior edutainment and Sumatran tiger feeding

4) Limited visits have a positive impact on the Sumatran Tiger in expressing its natural behavior

The results of the interview with the keeper, based on monitoring of the Sumatran Tiger with the limitation of visitors, actually gave the Sumatran Tiger more freedom of movement in expressing its natural behavior and looking healthier and more prosperous.

5) Online ticket sales and jakcard for visitors facilitate transactions.

Visitors while in the TMR area TMR has a "jakcard" which functions to carry out all transactions while in the TMR area and visitors can determine the time of visit to TMR and can minimize physical contact between visitors and TMR manager.

6) Integrated modes of public transportation with TMR locations

The TMR location is integrated with various modes of transportation available in Jakarta, including MRT, Transjakarta, Commuter Line.

7) Online training and capacity building of HR

During the COVID-19 pandemic, PKBSI as the supervisor of Conservation Institutions throughout Indonesia often conducts online training and capacity building for Conservation Institution managers

Threats

1) The closure and restrictions on TMR visits have been closed several times for the public.

Visitor restrictions up to 75%, up to visitor restrictions where only the people of DKI Jakarta are allowed to visit TMR, this has an impact on the income of funds sourced from ticket sales and LK management. more for animals

2) The process of acquiring Sumatran Tigers for adding new blood from other LK is still limited

The Sumatran tigers in TMR are already close in lineage and new blood is needed to prevent Sumatran tiger inbreeding which can affect its genetic purity. In addition, requests for new blood during a pandemic are affected by the WFH system from processors during the COVID-19 pandemic and regulatory changes.

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3) Procurement of feed and medicine is constrained during the COVID-19 pandemic

The impact of the COVID-19 pandemic has the potential to slow down the distribution process of feed and medicine, especially for the types of feed and medicine imported from abroad, this has an indirect impact on the management of the Sumatran Tiger in TMR.

4) Pest control activities need to be improved.

Based on interviews with the keeper and field monitoring, feeding is carried out in the afternoon and feed is placed on the floor of the sleeping cage. The food given is usually not eaten by the Sumatran tiger immediately which can invite pests such as rats to join in eating the meat in the cage so that the feed becomes unhygienic and allows the transfer of disease from mice to Sumatran tigers.

5) Jakarta is the epicenter of the COVID-19 pandemic

Jakarta is the area where the most people are confirmed to be infected with COVID-19 and the potential for spread is very high

TMR Internal-External Factor Analysis Making IFE and EFE Matrix

The value of Internal Factor Evaluation (IFE) was obtained from the results of a questionnaire given to 10 respondents who were not TMR managers but had knowledge of Sumatran tiger management. Respondents consisted of 5 ASN employees of the Directorate General of KSDAE, Ministry of LHK consisting of 1 Section Head and 1 Species Preservation staff, 3 PEH and 5 PKBSI members. The results of the External Value Evaluation Factor (EFE) were carried out by giving questionnaires to 12 respondents from elements of the TMR management who were directly related to the management of the Sumatran Tiger which consisted of 1 Curator, 2 Veterinarians, 1 Public Relations, 1 Feed Compounder and 7 Keepers. TMR's internal and external factor rating weighting scores are presented in the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices.

Cartesian Diagram SWOT Analysis

The results of the IFE analysis obtained a positive internal value of 0.486 which would be projected on the X axis and the results of the EFE analysis obtained a negative external value of 0.195 which would be projected on the Y axis. Based on the results of the IFE and EFE analysis above, the position of TMR in the management of the Sumatran Tiger is in quadrant I where internal and external factors have positive values, which means that in the management of the Sumatran Tiger TMR has opportunities and strengths. The strategy that must be implemented is a growth strategy or supporting an aggressive growth policy.

SWOT Matrix

According to David **[24]**, the SWOT Matrix is a matching tool that helps in determining decisions to develop four types of strategies, namely:

1. SO (Strength-Opportunity) strategy is a strategy that utilizes internal strengths to be able to generate profits from existing external opportunities.
2. WO (Weakness-Opportunity) strategy is a strategy to improve internal weaknesses by taking advantage of existing external opportunities.
3. ST strategy (Strength-Threat) is a strategy that uses its internal strengths to avoid or reduce the impact of external threats faced.
4. WT (Weakness-Threat) strategy is a defensive action strategy aimed at reducing internal weaknesses and at the same time avoiding external threats.

Carried out on the internal and external environment of TMR, then the matching stage is carried out using the SWOT matrix to formulate alternative strategies that are realistic and can be applied to the management of Sumatran tigers in TMR

Strategy Alternative Ranking

The ranking is done by adding up each external and internal factor. A high score indicates that the strategy is more prioritized than a low score.

IV. CONCLUSION

Based on the results of the study, that the operational management of the Sumatran Tiger at TSI Cisarua Bogor and TMR runs according to the rules of animal management applied at LKU even though the COVID-19 pandemic has affected the income generated from visitor entrance tickets, especially for TSI Cisarua Bogor. In addition, based on the results of research at TMR and several previous studies, Sumatran tigers have a high vulnerability to infection with COVID-19, so extra efforts are needed to prevent the spread of COVID-19 around the Sumatran tiger management environment. The implication of this research is to minimize the impact of the COVID-19 pandemic on the operational management and protection of Sumatran tigers in LKU, the government together with PKBSI and LKU managers need to immediately draw up an emergency plan for animal management, especially the Sumatran tiger while still being guided by aspects of animal welfare and preparing SOP for preventing the spread of COVID-19.

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