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Function and effectiveness of Management of the Bukit Barisan Selatan National Park, Indonesia

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Abstract

This study aims to determine the functional status of the area and the management effectiveness of the Bukit Barisan Selatan National Park (BBSNP). The effectiveness of conservation area management is needed to determine success in managing conservation areas, especially those related to achieving management goals. The method used in this research is a literature study conducted in August-September 2022. Analysis of the management effectiveness of the BBSNP uses the METT (Management Effectiveness Tracking Tools) method which has been carried out by the BBSNP Center. The results showed that the level of effectiveness of BBSNP in the 2015-2019 strategic planning period was 77%. This achievement exceeded the Directorate General of Natural Resources and Ecosystem Conservation Strategic Plan target for that period because the minimum index value was 70%. The status of BBSNP that year was Tropical Rainforest Heritage of Sumatra. So it is very possible that there is an intensive management strategy to maintain this status. The role of leadership and management support from all parties is needed to always maintain management effectiveness and optimize the area's functions according to the vision, mission and management objectives.

Keywords: Effectiveness; Conservation Area; BBSNP; History and function of the area

1 Introduction

A National Park is a nature conservation area that has native ecosystems, managed by a zoning system that is used for research, science, education, supporting cultivation, tourism and recreation purposes (Constitution Number 5/1990). Bukit Barisan Selatan National Park (BBSNP) is one of the conservation areas in Lampung Province and is managed by the BBSNP Center. Based on the Regulation of the Minister of Environment and Forestry Number: P.7/Menlhk/Setjen/OTL.0/1/2016 dated 29 January 2016 concerning the Organization and Work Procedure of the National Park Technical Implementation Unit, the Bukit Barisan Selatan National Park Center is the Technical Implementation Unit The Ministry of Environment and Forestry is responsible to the Director General of Conservation of Natural Resources and Ecosystems. The BBSNP Center was designated as the BBSNP Center with the main objective of increasing the effectiveness of sustainable management of biodiversity (Based on Minister of Forestry Regulation Number P.03/Menhut-II/2007). According to Bappenas (2016), Biodiversity is all living things on earth including all types of plants, animals and microbes. The BBSNP area has very high biodiversity, one of which is a habitat for protected flora and fauna and has the potential for natural tourism services with certain characteristics. Wulandari (2015) states that Bukit Barisan Selatan National Park (BBSNP) is a nature conservation area that has a lot of potential, both flora and fauna which are classified as rare. Rare and protected flora in BBSNP include the Giant Padma (*Rafflesia arnoldii*), Corpse Flower (*Amorphophallus, sp*) and Nepenthes (*Nephenthes, sp*). Protected fauna include large mammals such as the Sumatran tiger (*Panthera tigris sumatrae*), Sumatran elephant (*Elephas maximus sumatranus*) and Sumatran rhinoceros (*Dicerorhinus sumatrensis*).

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The long journey of determining the status of the BBSNP Conservation Area starting from its status as a Wildlife Sanctuary to becoming a national park will certainly often be faced with two difficult decision choices, between the interests of conserving the area's biodiversity which requires maintaining the integrity and sustainability of the area or the interests of the people around the area who depend for their livelihoods from the area's natural resources. In this case, of course, each management has different problems depending on the conditions and situation in the conservation area. To find out the effectiveness of BBSNP management based on its current status, this research needs to be carried out because starting in 2011 BBSNP is included in the *List of World Heritage in Danger category*. According to Masitoh, S. (2018), Effectiveness is a measure of the success or failure of an organization in achieving its goals. If an organization achieves its goals then the organization has been running effectively. Measuring organizational effectiveness is not a simple thing, because effectiveness can be assessed depending on who evaluates and interprets it. Based on List in *Danger* status provide an unfavorable view at the local, national and global levels of the seriousness of policy makers and implementers in related to the Indonesian government's commitment to rescue efforts biodiversity in the Conservation Area , therefore the effectiveness of BBSNP management must be maintained.

This research was conducted in August – September 2022 on the basis of evaluating the effectiveness of the management of the Conservation Area or BBSNP in this study referring to the Decree of the Director General of Natural Resources and Ecosystem Conservation Number: P.12/KSDAE/SET/KUM.1/12/2017 concerning Guidelines for Assessment of Effectiveness of Area Management Conservation. Assessment of the effectiveness of conservation areas needs to be done to find out problems in management and to improve or find solutions to problems that arise as a result of a policy in managing conservation areas. According to Nuralam, et al (2015), evaluation of management effectiveness is an effort to monitor activities or elements in management so that obstacles can be identified in the process of achieving goals. The evaluation of the management effectiveness of conservation areas in Indonesia was initiated in 2010 through the *Rapid Assessment and Prioritization of Protected Area Methodology* (RAPPAM) and *Management Effectiveness Tracking Tool* (METT) methods. Then in 2015, Indonesia officially adopted METT as a national policy as one of the main performance indicators of the Ministry of Environment and Forestry (KLHK).

Management effectiveness is needed to measure the extent to which a management activity is implemented in achieving management objectives. It is known that METT is a method used to assess an area management whose use is relatively quick and easy to complete, so that conservation area officers can carry out *self-assessments* to be able to find out how far management of an area has been effectively implemented. Assessment of management effectiveness based on the current area status is an important activity in order to improve the management of conservation areas (Bappenas, 2015). Effectiveness shows the success of achieving the goals set (G. Senoaji, et al. 2021). Effectiveness is needed to achieve the goals that have been determined in every organization, activity or program (Alparisi, et al. 2019). According to Hockings *et al.* (2006) in Dahlan and Septiningsih (2019), management effectiveness is a true assessment based on achievement. Sutikno and Maryunani (2006) in Oktavinus *et al.,* (2020) state that effectiveness assessment must be part of an effective management cycle, which is related to established values, objectives, and policies.

According to The International Union for Conservation of Nations (IUCN) in 2006, the management effectiveness assessment framework in general is expected to guide assessment tools developed in the world. The management effectiveness assessment framework based on IUCN (2006), includes an understanding of the context, planning, resource allocation (input), processes, products and services (output), and the impact or outcome achieved. This means that all the substances contained in METT are in accordance with the 2006 IUCN framework. Thus the analysis of the effectiveness of BBSNP management using METT is valid.

2 Material and methods

The research was conducted in August - September 2022 in the BBSNP. The object of this study is the Bukit Barisan Selatan National Park Main Office as the Technical Management Unit for the BBSNP conservation area as one of the *Tropical Rainforest Heritage of Sumatra*, whose office is administratively located in Kotaagung, Tanggamus Regency, Lampung Province - Indonesia.

Research uses the method of literature study or literature study which is directed at finding information data through documents, journals, books and research results related to research. According to Nazir (2013), literature study is a data collection technique by conducting a review study of books, literature, records, and reports that have something to do with the problem being solved. Especially for the effectiveness of BBSNP management using METT. The variables analyzed by METT are understanding of the context, planning, resource allocation (input), processes, products and services *(output)* , and the impact or outcome achieved (UNESCO, 2006), where the METT Conservation Area assessment system refers in the Decree of the Director General of Natural Resources and Ecosystem Conservation

Number: P.12/KSDAE/SET/KUM.1/12/2017 concerning Guidelines for Evaluating the Effectiveness of Conservation Area Management.

3 Results and discussion

3.1 Management Effectiveness of BBSNP Area

3.1.1 Status and Management Effectiveness of BBSNP

The Strategic Plan for the Directorate General of Conservation of Natural Resources and Ecosystems for 2015-2019 contains an elaboration of the strategy for implementing the Natural Resources and Ecosystem Conservation Program. The Strategic Plan is a guideline for all work units within the Directorate General of Conservation of Natural Resources and Ecosystems of the Ministry of Environment and Forestry. Based on the Regulation of the Minister of Environment and Forestry Number: P.7/Menlhk/Setjen/OTL.0/1/2016 dated 29 January 2016 concerning the Organization and Work Procedure of the National Park Technical Implementation Unit, it is stated that the National Park Technical Implementation Unit (UPT) is the managing unit for the conservation of natural resources and their ecosystems which is under and responsible to the Director General of Conservation of Natural Resources and Ecosystems who has the task of " *organizing the conservation of natural resources and their ecosystems based on the provisions of laws and regulations* ". To optimize management, the BBS TN area is divided into 2 (two) managed areas, namely the Semaka I National Park Management Sector and the Liwa Region II National Park Management Sector.

In the 2015 - 2019 Strategic Plan of the BBS TNB Center, one of the specific targets to be achieved by the BBS TNB Center is to optimize the management of BBSNP BBSNP with a METT value of ≥70%. If a conservation area gets this value, it means that the area is well managed. The METT Assessment of Conservation Areas refers to the Decree of the Director General of Natural Resources and Ecosystem Conservation Number: P.12/KSDAE/SET/KUM.1/12/2017 concerning Guidelines for Evaluating the Effectiveness of Conservation Area Management. To find out the organizational performance achievements of the BBSNP Center in 2015-2019 performance measurements have been carried out on activity targets and activity performance indicators. This performance measurement can be used as a basis for assessing the success and failure of implementing activities in accordance with the goals and objectives that have been set in order to realize the vision and mission of the BBSNP Center.

Based on the Decree of the Director General of Natural Resources and Ecosystem Conservation Number: SK.112/KSDAE/KK/KSA.1/5/2020 concerning Establishment of Baseline Values for the Effectiveness of Management of Nature Reserve Areas, Nature Conservation Areas and National Parks in 2019, the value of METT BBSNP in the 2015-Strategic Plan period 2019 was 68% (2015), 74% (2017) and 77% (2019), which means that it exceeded the target of the Directorate General of Natural Resources and Ecosystem Conservation Strategic Plan for that period, namely the value of management effectiveness > 70%. The increase from 68% to 74% is in the process and *outcome variables*. This is logical because according to D. Kodrat (2013), In the process of establishing relationships that will affect the vision and mission of the organization, and will produce effective and efficient results if the results are in accordance with the vision and mission of the organization. Biodiversity has ecological, economic, aesthetic, artistic, social and cultural values, recreational values and research (Senoaji, et al. 2021). This is in line because effective activities are also shown by suitability research activities with issues ecological and socio-economic growing in the area conservation (Nordiansyah *et al.,* 2016). The increase to 77% occurred due to variables *planning* has increased. This condition is very likely to occur, in the opinion of Sinoaji, et al (2021), planning is related to regulations in area management such as long-term and short-term management plans, all existing regulations are made for the management of conservation areas. Assessment of effectiveness is an evaluation that must be integrated into the culture and management processes to improve long-term management performance (Rumimpunu *et al.,* 2020).

Furthermore, it was stipulated in the Decree of the Director General of Natural Resources and Ecosystem Conservation Number: SK.4/KSDAE/KK.1/1/2021 dated January 19, 2021 concerning the value of the management effectiveness of Conservation Areas until 2020 and for the BBSNP Center is 77%. The key to the success of an organization like the BBSNP Center is thanks to the cooperation of the parties in achieving goals.

Several factors became problems or obstacles in implementing BBSNP management before 2019 (BBSNP, 2019), including:

- The impact of vehicle traffic on the national road sections in the BBSNP area (Sangi Bengkunat road section, Liwa Krui road section, and the Pugung Tampak-Boundary road section of Lampung Bengkulu Province).

- There are still conflicts between humans and wild animals (Tigers, Elephants and Bears) around/outside the BBSNP area.
- Limited number of Human Resources (officers) both in quality and quantity.
- Coordination with the parties that needs to be improved.

3.1.2 Management effectiveness of BBSNP based on METT

Monitoring efforts on the condition of protected area management have been developed by several institutions in the world, referring to the effectiveness monitoring issued by the *International Union for Conservation of Nature* (IUCN). One tool that has been widely used is *the* METT produced by the World Bank and WWF in 2007. The Directorate General of Conservation of Natural Resources and Ecosystems is based on a number of considerations, including implementation experience, simple , and produce a measurable picture, consider using METT as a tool to use in monitoring the level of management of protected areas in Indonesia. Therefore the Directorate General of Natural Resources and Ecosystem Conservation determines the effectiveness value of a conservation area is at least 70 points (Manapa, 2021).

In 2006, *the World Commission on Protected Areas* (WCPA) has developed a framework for evaluating the effectiveness of management for conservation areas, namely understanding the context, planning, allocation of input resources, processes, products and services (outputs), and the impacts or *outcomes* that are achieved. This framework is built on the principle that good conservation areas must follow a cyclical process that includes six elements that are critical to building an understanding of how effectively a conservation area is managed (Hockings, et al. 2006).

Context

According to Bappenas (2015), the context in terms of assessing management effectiveness is defined as an assessment in terms of the importance of conservation areas, threats and related policies, as outlined in legal status. Context relates to the law in an area (G. Sinoaji, et al. 2021). Context and planning relate to the design of a conservation area (Manumpil *et al.,* 2017). Context includes how status values, threats, and issues are managed (Manumpil *et al.,* 2017). Bukit Barisan Selatan National Park was officially designated in 1935 as the South Sumatra I Wildlife Reserve which was designated a National Park in 1982 based on official government policy. The BBSNP area has a clear legal status with good relations and cooperation with the communities around the BBSNP area. Other national parks in Indonesia are inseparable from various disturbances that can cause damage and disruption of ecosystems in conservation area areas (Kusuma, et al. 2022). One of the threats to conservation areas comes from the people who live around and within them (Najmi *et al.,* 2020). These threats are usually caused by societal pressure and are influenced by various factors, one of which is anthropogenic factors. Anthropogenic factors are factors that arise or are caused by human activities (Dewi and Istiadi, 2016). According to Dunggio, et al. (2009) the problem of national park management is a social problem that can only be solved through changes in the institutional structure that regulates the allocation of resources to achieve the desired performance. Conflicts of *stakeholder interests* in the utilization of forest resources have an impact on the occurrence of conflicts (Rahman & Jalaluddin. 2022).

Planning

According to Bappenas (2015), planning or *planning* describes what is to be achieved from a management, and how to achieve it. This planning is a management tool that can help managers of marine protected areas to focus more on implementation, including making policies in accordance with existing authorities (Juliyanto *et al.,* 2019). Measuring planning effectiveness three general criteria, namely: (1) goal setting; (2) certainty law; and (3) site design for conservation areas (Nordiansyah *et al.,* 2016). The role of the BBSNP Center is to support the strategic steps taken by the Directorate General of Natural Resources and Ecosystem Conservation in the form of ensuring the effectiveness of national park management. In the planning process it involves various parties such as the participation of key animal experts (tiger, rhino and Sumatran elephant) including in the formulation of area management plans. According to Wiratno (2018), the parties working together should gradually be able to apply the four principles of governance, namely: participation, openness, collective responsibility, and accountability.

It turns out that in 2011, BBSNP received an *endangered predicate*, planning for the 2015–2019 period needs to be increased for optimality and accuracy with field conditions. During this period of the year there were still many animal and human conflicts in the BBSNP and a decline in the Sumatran rhino population in the BBSNP . According to Wulandari *et al.* (2019), the reality on the ground shows that the BBSNP managed area is also not free from forest damage due to human intervention in the form of encroachment, road clearing, and illegal logging or illegal logging. Conflicts between humans and elephants can cause harm to both humans and elephants, such as material losses and mental losses (Pratiwi *et al.,* 2020). Conflicts between elephants and humans occur because elephant habitat has undergone land conversion where it is planted with community plants that elephants like (L. Purwanuriski, et al. 2022). Pratiwi *et al.* (2022) also

stated that human-elephant conflict occurs because elephants leave forest areas and enter human settlements so that there is no balance of welfare between humans and elephants. This is important because these animals are often in conflict with humans which causes their lives to be threatened (Wahyuni et al., 2020). According to Roziaty *et al.* (2017) , this occurs because it is influenced by internal factors (reproductive system) and external factors (illegal activities such as decreased habitat quality and hunting of endangered animals).

Inputs

According to Bappenas (2015), input includes the resources needed to achieve management objectives. In line with the statement of Manumpil *et al.* (2017) that how sufficient resources are currently available to manage. Aspects of input in activities conservation area management is everything needed in the process management to help achieve management objectives (Nordiansyah *et al.,* 2016). The limited human resources at the BBSNP Center are a challenge in realizing area sustainability and achieving activity targets (Damanik *et al.,* 2019). With an area that reaches ± 313,572.48 Ha and surrounded by 223 villages in the vicinity, the management requires contributions and collaboration from various existing stakeholders in supporting management so that optimal management of the national park is realized. Regarding the availability of information, the BBSNP Center still needs data and information that can be used to support planning and decision making. According to Dungio, *et al.* (2009), the lack of data and information on the richness of biodiversity in national parks is caused by a lack of research activities in national parks carried out by researchers from universities and research institutions, in addition to the limited number of technical personnel in national parks causing an inventory of potential biodiversity to be incomplete can be implemented properly.

Data related to biodiversity and its relation to ecosystem functions still requires further research to achieve sustainable forest management (Hartoyo *et al.,* 2019). Based on the enormous opportunities for utilization for the development of community welfare, comprehensive documentation of biodiversity is a very important source of data (LIPI, 2014). There is still a great need for data input and updated information, so that the BBSNP still has to continue to improve its performance even though it has obtained a value above 77%. Updating data and information will greatly support sustainable management of a forest (Purwatiningsih, 2022).

Process

According to Bappenas (2015), the process describes the process by which management activities are carried out. According to Nordiansyah *et al.* (2016), the effectiveness of the management process measures 3 general criteria, namely: (1) availability of a detailed strategic plan management; (2) mechanism decision-making; (3) activities research, monitoring, and evaluation. The management process includes how management is carried out and responds to existing challenges, both from the aspects of planning, training and capacity building, community relations and management implementation (Dahlan and Septiningsih, 2019). Periodic area security patrols in the context of protecting and securing the BBSNP area are still being carried out by involving community forestry partners (MMP). There are still conflicts between humans and wild animals (Tigers, Elephants and Bears) around /outside the BBSNP area and they have been handled functionally, but the amount exceeds the budget provided so that the BBSNP Center has coordinated with the local government and partners regarding human-wildlife conflicts wild.

There are assisted communities such as conservation cadres, fire care communities and forestry police partner communities as an education/awareness program related to area management needs, as well as the participation of conservation cadres in providing input on management. According to Wiratno (2018), *multi-level leadership* must be encouraged to accelerate and expand various collaborations with all parties, both with the villagers around the conservation area and anyone who is interested in working together, to solve the problems faced. This *multi-level leadership* is expected to be able to embrace and gain management support at all levels of leadership (central government, local government, village government, and traditional elders) (Prayitno, 2020). Multilevel leadership becomes important in making and implementing innovative decisions that differ from existing norms (Myers *et al.,* 2016). The high METT score obtained by BBSNP in 2020 still requires processes to improve human resources both in terms of the number and quality of human resources. Management of a sustainable forest area including a national park must be supported by adequate human resources (Suhendri *et al.,* 2017) .

Output

According to Bappenas (2015), the output analyzed is the result of management implementation. Outputs and impacts relate to the distribution of various results or targets achieved (Manumpil *et al.,* 2017). Assessment of the outputs in the conservation area management cycle is intended to find out whether over the last two years the output has been consistent in achieving the general management objectives, annual work planning, and its suitability in dealing with pressures and threats experienced by conservation areas (Dahlan and Septiningsih, 2019). Management in BBSNP

produces *outputs* in the form of strategic plan documents, annual work plans, Institutional/Ministry Budget Work Plans. Standard Operation Procedures, Terms of Reference, and many other documents as material for consideration in managing the area. As for community empowerment, the BBSNP Center has signed a conservation partnership cooperation agreement through a program of granting access to the utilization of non-timber forest products (resin resin). In order for the output of this program to be optimal, it is necessary to carry out intensive assistance by field officers regarding the development of these communities, including achieving the goal of having a conservation partnership cooperation agreement.

According to Wiratno (2018), management of conservation areas requires the support of various scientific disciplines, a multi-stakeholder approach, supported by consistent and adaptive policies by the government starting from the central, provincial, district, sub-district, village, gampong, mukim, down to the site level, with assistance which is also consistent and right on target from CSOs, local universities, *local champions*, activists, and *resort staff* . As stated by Harizon *et al.* (2020) that the success of conservation management also depends on the support of the local community. The role of government and stakeholders and support from the community around the area is important for back together in arranging re-strategic plans conservation area management already existed (Nordiansyah *et al.,* 2017).

Outcomes

Various *outcomes* have been obtained by the BBSNP, and even though it has scored above 77%, it turns out that BBSNP still requires coordination programs with relevant parties at the local, national and global levels so that their functions are more guaranteed. According to Bappenas (2015), outcomes are assessed more focused on the impact of conservation area management on goals. According to Manapa (2021) *outcome* is the impact achieved. Outputs and *outcomes* relate to the distribution of various results or targets achieved (Manumpil *et al.,* 2017). Until now, the economic benefits that can be felt by the community around the area are the community being involved in decision making by recruiting the community as conservation cadres, community forestry police partners, fire care communities and even the community being included in the conflict management task force. In addition, communities that have partnered with the BBSNP Balai Besar in a Conservation Partnership Cooperation Agreement have legal access to access non-timber forest product collection in the form of gum resin.

In terms of knowledge, BBSNP contributes a lot of research results conducted in the BBSNP area which can be used as a reference or material for consideration in making decisions. From an ecological perspective, BBSNP has the potential for environmental services as a tourist attraction that can be used to increase state revenue from the non-tax sector so that if translated, there will be a lot of benefits to be gained from the management of the BBSNP area. According to Karlina (2015), ecotourism is a development concept originating from the tourism industry, so that it is sustainable, with the aim of supporting natural and cultural protection. As well as enabling local communities to become managers who help their economic development. According to Rahayu *et al.* (2022) the role of the community in developing tourist objects assists managers in providing guide services, services for selling and transportation.

Bukit Barisan Selatan National Park as a conservation area with several superior animals such as the Sumatran Rhinoceros, Sumatran Elephant, Sumatran Tiger, currently has a Way Canguk management station as one of the specific management locations for these superior animals. Through collaboration with the NGO WCS-IP, the Way Canguk research station has been managed very well. The Way Canguk research station functions as a research center. Various efforts that have been made have yielded results, such as tree phenology data series, gibbon habitat and population data and other data that supports management. The new way of managing conservation areas requires *leadership skills* with management support at all levels, strong *leadership* must prove capable of building multi-stakeholder collaboration or collaboration by adhering to the principles of *mutual respect, mutual trust* and *mutual benefits* Collaboration or partnership is a necessity in managing conservation areas, and therefore successful management of conservation areas is a collective success (Wiratno, 2018).

As for mitigating conflicts between wild animals and humans, BBSNP has 5 (five) tame Sumatran elephants from Way Kambas National Park. Location of elephants at Pemerihan Resort Management Section of the National Park Region II Bengkunat Management Division of the Semaka Region I National Park. These elephants are used to drive away and herd animals if there is a conflict outside the BBSNP area (Purwanuriski, 2022). According to Bappenas (2015), the presence of the National Park Authority as the manager of the conservation forest area provides significant benefits for the surrounding community. With the presence of a National Park and the collaborative management that is implemented, the use of a national park as a conservation area as well as the economic resources contained therein can run concurrently, but with the consideration that efforts to utilize the economy cannot be separated from conservation goals (Halim, 2016). The designation and management of national parks is one way to obtain benefits from forest

resources other than timber, so that the benefits can be enjoyed in a sustainable manner across generations (Dunggio et al., 2009).

4 Conclusion

Assessment of the Effectiveness of Conservation Area Management is needed to guide management strategy formulation in order to improve the quality of sustainable Conservation Area management. By carrying out the Assessment of the Effectiveness of Conservation Area Management, it is hoped that the managers who are directly and indirectly involved will know the developments in the management of the conservation area. Based on the Decree of the Director General of Natural Resources and Ecosystem Conservation Number: SK.4/KSDAE/KK.1/1/2021 dated January 19, 2021, the value of the effectiveness of Conservation Area management until 2020 for the BBSNP Center is 77% and is a value above the standard set by the government, namely >70%. Despite its high value, BBSNP still requires appropriate efforts to ensure management objectives are achieved.

Recommendations

- Based on the value from the METT analysis, the following variables need to be improved, namely:
- The input variable, where with a limited number of human resources, the BBSNP manager requires contribution and collaboration from various existing stakeholders in supporting management so that optimal management of the national park is realized.
- Outcome variable, where the BBSNP still requires coordination programs with relevant parties at the local, national and global levels so that their functions are more secure.

Compliance with ethical standards

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There is no conflict of interest for your benefit. All authors have participated in

- Conception and design, or analysis and interpretation of data;
- Draft articles or critically revise them for important intellectual content;
- Final version approval.

References

[1] Law No. 5 of 1990. Concerning the Conservation of Living Natural Resources and Their Ecosystems.

[2] Regulation of the Minister of Environment and Forestry Number P.03/Menhut-II/2007 concerning the Organization and Work Procedure of the National Park Technical Implementation Unit.

[3] Regulation of the Minister of Environment and Forestry Number: P.7/Menlhk/Setjen/OTL.0/1/2016 concerning the Organization and Work Procedure of the National Park Technical Implementation Unit.

[4] Regulation of the Director General of Natural Resources and Ecosystem Conservation Number: P.12/KSDAE/SET/KUM.1/12/2017 concerning Guidelines for Assessment of the Effectiveness of Conservation Area Management.

[5] Decree of the Director General of Natural Resources and Ecosystem Conservation Number Number: SK.4/KSDAE/KK/KSA.1/1/2020 concerning Determination of the Effectiveness Value of Conservation Area Management Up to 2020.

[6] Decree of the Director General of Natural Resources and Ecosystem Conservation Number Number: SK.112/KSDAE/KK/KSA.1/5/2020 concerning Establishment of Baseline Values for the Effectiveness of Management of Nature Reserve Areas, Nature Conservation Areas and National Parks in 2019.

[7] Ministry of National Development Planning / National Development Planning Agency (Bappenas). *Assessment of the Effectiveness of Management of Indonesia's Protected Areas*. p.100. 2015.

[8] Ministry of National Development Planning (BAPPENAS). *Indonesia Biodiversity Strategy And Action Plan 2015 – 2020*. ISBN: 978-602.1154-49-6. 2016.

[9] Head of Program and Evaluation Section of the Secretariat of the Directorate General of KSDAE. *Statistics of the Directorate General of Conservation of Natural Resources and Ecosystems for 2020*, Jakarta: Ministry of Environment and Forestry, Directorate General of Conservation of Natural Resources and Ecosystems. 2020.

[10] Head of Evaluation and Reporting Sub-Division of the Bukit Barisan Selatan National Park Office. Performance Report for 2019. *Bukit Barisan Selatan National Park Office, Ministry of Environment and Forestry, Directorate General of Conservation of Natural Resources and Ecosystems*. 2020.

[11] LIPI. *Current Indonesian Biodiversity*. Book. Jakarta: LIPI Press. 2014.

[12] Nazir. Moh. *Research methods*. Ghalia Indonesia: Bogor. 2013.

[13] Ministry of Environment and Forestry. *Status of Indonesia's Forests and Forestry 2018*. Jakarta: Ministry of Environment and Forestry. 220 pp. 2018.

[14] Wiratno, 2018. *10 New Ways to Manage Conservation Areas in Indonesia*: Building a "Learning Organization," Jakarta: Directorate General of Conservation of Natural Resources and Ecosystems, Ministry of Environment and Forestry.

[15] Alparisi et al. *Evaluation of Land Cover and Management Effectiveness of the Bukit Kaba Tourism Park, Bengkulu Province*. Naturalis Research Journal of Natural Resources and Environment Management. 2019, 8(1): 11-19.

[16] Damanik, SE, & Purba, S. *Planning for Partnership Patterns in Improving the Welfare of Kph XIII Farmers in the Dolok Sanggul Area, Humbang Hasundutan Regency*. *Batik*. 2019, 23 (2): 582-591.

[17] Kodrat. *Quality Education System Input, Process, Output, Outcome: Functional, Productive, Effective, Efficient and Accountable*. Nusantara Islamic University. 2013.

[18] D. Kusuma, et al. Security and Protection of the Karimunjawa National Park area. Thesis. Diponegoro University. 2022.

[19] Dunggio, I. Gunawan, W. *Study of the History of National Park Management Policy in Indonesia*. Journal of Forest Policy Analysis. 2009, 6(1): 43-56.

[20] F. Rahman & M. Jalaluddin. *Management of Forest Resources Based on Local Wisdom in Balinese Communities*. Journal of Forests and Society. 2022, 14 (1): 51-60. ISSN: 1907-5316 ISSN Online: 2613-9979.

[21] G. Senoaji, et al. *The Effectiveness of the Management of the Seblat Nature Tourism Park (TWA) in Bengkulu Province and the History of the Functional Status of the Area*. Journal of Environmental Science. 2021, 19: 153-162. ISSN 1829-8907.

[22] Halim, LF *Management and ecotourism potential in Bantimurung Bulusaraung National Park. Africa*. 2016, 10 (2): 99-109.

[23] Hartoyo, APP, Wijayanto, N., Karimatunnisa, TA, & Ikhfan, AN.*Vegetation biodiversity in agroforestry practices and its relation to ecosystem function in Meru Betiri National Park, East Java*. *Journal of Tropical Forests*. 2019, 7 (2): 145-157.

[24] Harizon, H., Hertati, R., & Kholis, MN. *The level of community participation in the Lubuk Kasai fisheries reserve, Batang Pelepat waters, Bungo Regency, Jambi Province. SEMAH Journal of Water Resources Management*. 2020. 4 (1).

[25] Hockings, M., Stolton, S., Leverington, F., Dudley, N. and Courrau, J. *Evaluating Effectiveness: A Framework for Assessing Management Effectiveness of Protected Areas 2nd Edition. WCPA Best Practice Protected Areas Guidelines*. Glands: IUCN. 2006.

[26] Juliyanto, E., Krisanti, M., & Susanto, HA. *Analysis of priority management of the marine protected area of Ay-Rhun Island, Maluku Province. Journal of Tropical Marine Science and Technology*. 2009, 11 (3): 721-733.

[27] Karlina, E. *Mangrove Ecotourism Development Strategy in the Tanjung Bara Region, East Kutai, East Kalimantan*. Journal of Forest Research and Nature Conservation. 2015, 2 (2).

[28] L. Purwanuriski, et al. *Conflict Mitigation Analysis of Sumatran Elephants (Elephas maximus sumatranus, Temminck 1874) at the Bukit Barisan Selatan National Park*. Wilderness Journal. August 2022.5(2): 178-190. EISSN 2614-3453 P-ISSN 2614-7238.

[29] Manapa, FSJ. *Implementation of partnership regulations in increasing the effectiveness of conservation area management at the South Kalimantan Natural Resources Conservation Center (a case study in the Kelumpang Bay Nature Reserve, Sea Strait, Sebuku Strait.* Tropical Forest Journal, *9* (2), 342-353.

[30] Manumpil, AW, Mandagi, SV, & Lasut, MT. *The effectiveness of Bunaken National Park management.* AQUATIC SCIENCE & MANAGEMEN. 2019, 5 (1):11-17.

[31] Masitoh, S. *Analysis of Efficiency, Effectiveness and Contribution of Rural and Urban Land and Building Tax (PBBP2) to Regional Original Income*. Research Thesis. Purwokerto State Islamic Institute. 2018.

[32] Myers, R., Sanders, AJ, & Larson, AM. *Analyzing Multilevel Governance in Indonesia*. 2016.

[33] Najmi, N., Suriani, M., Rahmi, MM, Islama, D., & Nasution, MA. *The role of coastal communities in the management of coral reefs in the East Coast of Weh Island Conservation Area*. Journal of Tropical Fisheries. 2020, 7 (1):73-84.

[34] Nordiansyah, H. *Assessment of the effectiveness of conservation area management in the Padang Luway Nature Reserve Area, West Kutai Regency*. Agrifor: Journal of Agricultural and Forestry Sciences. 2016, 15 (1), 43-54.

[35] Nuralam, HD Walangitan, and MA Langi. *Evaluation of the Effectiveness of the Management of the Batuputih Natural Tourism Park and its Impact on Community Income*. EMBA Journal. 2015, 3:660- 671.

[36] Pratiwi, P., Rahayu, PS, Rizal, A., Iswandaru, D., & Winarno, GD Community perceptions of human and Sumatran elephant conflict (Elephas maximus sumatranus Temminck 1847) in Way Kambas National Park. *Sylva Lestari Journal*. 2016, 8 (1):98-108.

[37] Pratiwi, P., Iswandaru, D., Hilmanto, R., Febryano, IG, Ismanto, I., Sugiharti, T., & Subki, S. Analysis of humanelephant conflict around the Bukit Barisan Selatan National Park Pemerihan Resort based on perceptions the people of Bengkunat District, West Coast Regency. *Wilderness Journal*. 2022, 5 (1):106-118.

[38] Prayitno, DE Conservation partnership as an effort to resolve tenure conflicts in the management of conservation areas in Indonesia. *Indonesian Journal of Environmental Law*, 2020, 6 (2): 184-209.

[39] Purwatiningsih, SD The understanding of the community around the forest on information on forest conservation in utilizing and preserving Mount Halimun Salak National Park Forest. *IKRA-ITH HUMANIORA: Journal of Social and Humanities*. 2022, 6 (1):110-120.

[40] Rumimpunu, AOO Legal study on the conservation of living natural resources and their ecosystems in Indonesia. *LEX ET SOCIETATIS*. 2020, 8 (4):5-12.

[41] Suhendri, S., & Purnomo, EP Institutional strengthening in preventing and controlling forest and land fires in Muaro Jambi Regency, Jambi Province. *Journal of Governance and Public Policy*. 2017, 4 (1):174-204.

[42] Wahyuni, P., Febryano, IG, Iswandaru, D. & Dewi, BS Distribution of Trachypithecus cristatus (Raffles, 1821) langurs on Pahawang Island, Indonesia. Wilderness Journal. 2020.3(2): 89–96.

[43] Wulandari, C., Safe'i, R., Kaskoyo, H., & Winarno, GD. Species Diversity and Tree Carbon Stores at the Pemerihan Resort, Bukit Barisan Selatan National Park. *Sylva Lestari Journal*. 2019, *7* (2), 139-149.

[44] Dahlan, A. (2020, January). Status and level of management effectiveness of marine protected areas in Sulawesi. In Proceedings of the National Maritime and Fishery Seminar (Vol. 8, No. 1, pp. 111-119).

[45] Tropical Rainforest Heritage of Sumatra. UNESCO. Retrieved September 17, 2022. 21:35 WIB.