



THE EFFECTIVENESS OF THE RAWA AOPA WATUMOHAI NATIONAL PARK OFFICE IN MANAGING THE RAWA AOPA WATUMOHAI NATIONAL PARK AREA

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ABSTRACT

This study aims to analyze the effectiveness of the Rawa Aopa Watumohai National Park Office (BTNRAW) in managing the Rawa Aopa Watumohai National Park (TNRAW), an important conservation area in Southeast Sulawesi with a unique ecosystem and high biodiversity. The research employs a qualitative approach through literature studies, interviews, and SWOT analysis to identify strengths, weaknesses, opportunities, and threats affecting institutional performance. Data are analyzed by linking field findings with the principles of effectiveness in conservation area management. The results show that BTNRAW has several strengths, including adaptive human resource capacity, community empowerment programs, the use of technology such as GPS, drones, and hotspot monitoring systems, and cross-agency collaboration networks. However, there are weaknesses in field human resource availability, limited patrol facilities, high workloads, and the suboptimal implementation of zoning and digital reporting systems. This study concludes that BTNRAW's effectiveness is in the fairly good category but still requires strengthening in data management, human resource capacity, and multi-stakeholder coordination. The resulting strategic recommendations can serve as a basis for sustainable improvement of TNRAW governance.

Keywords: Conservation; Effectiveness; Management; National Park; TNRAW

INTRODUCTION

Rawa Aopa Watumohai National Park (TNRAW) is geographically located at 121°44'–122°44' East Longitude and 4°22'–4°39' South Latitude. Administratively, it is situated in Southeast Sulawesi Province across four regencies: Konawe Regency (9,698.70 ha), South Konawe Regency (30,625.50 ha), and Bombana Regency (44,206.16 ha), bringing the total area to 105,194 ha (RPJP TNRAW, 2018). This national park harbors biodiversity with a high level of endemism across its four ecosystem types: mangrove, savanna, peat swamp, and tropical forest ecosystems from lowlands to mountains. Overall, this area contains at least 533 plant species from 110 families and 321 recorded wild animal species, including 28 mammal

species (15 of which are endemic to Sulawesi), 218 bird species including Sulawesi endemics and migrants, 11 reptile species, 28 fish species, 3 amphibian species, and others (BTNRAW Strategic Plan, 2020).

The management of Rawa Aopa Watumohai National Park faces several problems and strategic issues that still hamper its effective management. These problems include unclear field boundary determination or area loss caused by various factors that threaten the legitimacy of the TNRAW area's existence; zone boundary marking that has not been implemented and management that has not been carried out optimally; damage in several areas due to encroachment and illegal logging activities, resulting in land cover change from forest to critical land and other uses outside the area's provisions, as well as a decline in wildlife populations; and management of the TNRAW area that has not been optimal at every level of the area's zone.

Based on these issues, this study aims to analyze the role and responsibilities of the Rawa Aopa Watumohai National Park Office (BTNRAW) in the effectiveness of area management, identify the obstacles faced, and provide policy recommendations that can optimize national park management. The results are expected to inform the formulation of better strategies to ensure the sustainability of the TNRAW ecosystem for future generations.

LITERATURE REVIEW

Studies on the effectiveness of conservation area management emphasize the importance of systematic evaluation of the extent to which protected areas are able to achieve the objectives of biodiversity protection and sustainable ecosystem functions (Hockings et al., 2006; Leverington et al., 2010). In the landscape of international and national scientific publications, frameworks such as the Management Effectiveness Tracking Tool (METT), developed by IUCN and WWF, have become standard references for assessing six key elements of management: context, planning, inputs, processes, outputs, and outcomes (Stolton & Dudley, 2016). A study by Coad et al. (2015) in *Conservation Letters* revealed that most conservation areas in developing countries still experience a gap between planning policies at the macro level and operational implementation at the site level, making effectiveness evaluation an essential instrument for identifying weaknesses in sustainable governance.

Most scientific journal research highlights that the main obstacle to the suboptimal effectiveness of conservation areas stems from an imbalance between resource availability (inputs) and the magnitude of external pressures (Bruner et al., 2001). Limited operational budget allocations, the minimal ratio of supervisory personnel (rangers) compared to the area managed, and inadequate patrol infrastructure often lead to weak field supervision (Gill et al., 2017). This phenomenon is studied in depth in various articles in the *Journal of Forest Research* and *Nature Conservation*, which show that limited monitoring functions at the site level are directly correlated with a high frequency of anthropogenic disturbances, such as land encroachment, forest fires, and illegal logging (Margono et al., 2014; Purwanto, 2021).

To mitigate personnel and budget constraints, current journal literature recommends a combination of geospatial technology integration and community-based conservation approaches (Borrini-Feyerabend et al., 2013). The use of remote monitoring technologies such as remote sensing, geographic information systems (GIS), drones, and hotspot monitoring platforms has been shown to increase efficiency and speed of response to spatial threats (Pramudya et al., 2020; Abdullah, 2022). Furthermore, research published in *Conservation Biology* emphasizes the importance of involving local communities through conservation partnership schemes and the formation of community self-help groups to minimize conflicts over spatial use and build social capital in area protection (Berkes, 2009; Suharsono, 2020). Determining the direction of conservation area management policies requires a comprehensive strategic analysis approach to map the interactions between internal and external organizational factors (David & David, 2017).

RESEARCH METHODS

The research was conducted at the Rawa Aopa Watumohai National Park Office, located in Tatangge Village, Tinanggea District, South Konawe Regency, Southeast Sulawesi Province. The research preparation stage was carried out in September, and data collection took place from October 2025 until the final stage of compiling a complete report in March 2026. The data collection technique was carried out using semi-structured in-depth interviews based on prepared interview guidelines and document study, which included the 2018–2028 BTNRAW Long-Term Management Plan (RPJP) Document, the 2020–2024 Strategic Plan (RENSTRA), and the Annual Performance Report (LKJ) document. The sampling technique was carried out by purposive sampling with key informants, namely the Head of the Section whose main duties and functions are directly related to the management of the Rawa Aopa Watumohai National Park Area, including the Head of the Rawa Aopa Watumohai National Park Office, so that the number of respondents was 5 (five) people.

Data from interviews and document studies were analyzed using triangulation through comparison between interview results and official documents available at the Center, while the validation stage involved experts in related fields or academics to review data adequacy, test coding logic, and validate the weights and ratings of the SWOT matrix.

Data analysis in this study was conducted using an analytical approach supported by the IFAS (Internal Factor Analysis Summary) and EFAS (External Factor Analysis Summary) matrices. This approach was used to comprehensively assess the effectiveness of Aopa Swamp management, taking into account internal and external factors that influence management success.

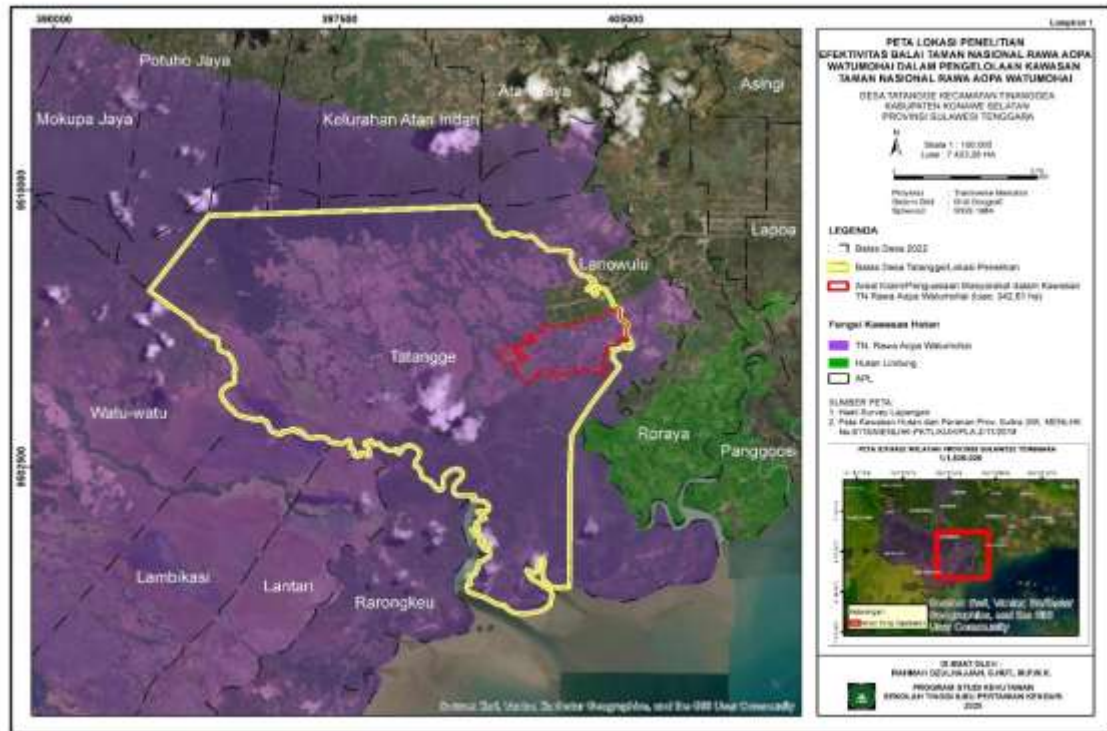


Figure 1: Research Location Map (2026)

RESULTS AND DISCUSSION

Based on the identification of the results of in-depth interviews with respondents and studies of the RPJP, RENSTRA, and annual LKJ documents of the Rawa Aopa Watumohai National Park Office, internal and external factors were obtained in the management of the Rawa Aopa Watumohai National Park area.

Table 1. Internal factors (IFAS) and external factors (EFAS) in TNRAW management

Internal Factors		External Factors	
S	• Human Resources Competence & Adaptability • Community Education and Empowerment Program • Patrol Technology and Operations • Partnership and Governance	O	• Capacity Development and HR Recruitment • Additional Policy Support and Funding • Partnership and Program Expansion
W	• Personnel Limitations (Quantity and Expertise) • Limited availability of budget and facilities/infrastructure • Institutional & Legal Constraints	T	• Anthropogenic Pressure and Community Compliance • Ecological and Climate Risks • Cross-Sector Governance Challenges

(Source: Data processing results, 2026)

The weighting in this study illustrates how important or critical an internal (strengths/weaknesses) or external (opportunities/threats) factor is to the effectiveness of area management. Ratings are used to measure actual conditions on the ground or the effectiveness of an organization's response to each factor. Four groups of factors are analyzed: Strengths, Weaknesses, Opportunities, and Threats.

All factors are weighted, rated, and scored to quantitatively understand BTNRAW's strategic position through the IFAS and EFAS matrices.

The evaluation results through the Internal Factor Analysis Summary (IFAS) and External Factor Analysis Summary (EFAS) matrices show the objective condition of the governance of the assessed area. In the internal aspect, the total strengths score was recorded at 3.542, supported by the high flexibility and adaptability of personnel, the effectiveness of public education programs (Bina Cinta Alam), and the use of monitoring technology (drones, GPS, and the Sipongi system). However, the total weaknesses score is more dominant at 3.923. The gap in the number of field personnel (17 people) compared to the ideal workload analysis (230 people for an area of $\pm 109,514$ ha), the minimal allocation of the operational budget ($\pm \text{Rp}200,000/\text{ha}/\text{year}$), and the limited authority to enforce the law independently are the main obstacles in optimizing management in the field.

The quantitative results of the IFAS matrix reveal a notable paradox: while the institution possesses adaptive human resources and has adopted modern monitoring technologies, the aggregate weakness score (3.923) exceeds the strength score (3.542). This gap of 0.381 points suggests that internal operational constraints—particularly the shortage of field personnel and limited budget—exert a stronger influence on management outcomes than the existing strengths can offset. When mapped against the METT framework (Hockings et al., 2006; Stolton & Dudley, 2016), this pattern reflects a common challenge in protected area management: strengths in planning and technological inputs are insufficient if the foundational inputs of staff and funding remain inadequate (Coad et al., 2015; Leverington et al., 2010). The finding that 17 field officers must oversee approximately 109,514 hectares—yielding a ratio of 1 officer per 6,442 hectares—is far below the ideal requirement of 230 personnel. This discrepancy aligns with global assessments showing that capacity shortfalls, rather than lack of strategic intent, often impede effective conservation (Gill et al., 2017; Bruner et al., 2001). Therefore, any effort to improve BTNRAW's effectiveness must prioritize the recruitment and deployment of field staff and the allocation of operational budgets, as these are prerequisites for translating technological and community-based strengths into tangible conservation outcomes.

Table 2. Results of SWOT Analysis Calculations based on IFAS and EFAS

	SWOT factors	Score	Position Index
	IFAS Factors		(SW)
1	Strength (S)	3,542	-0.381
2	Weakness (W)	3,923	
	EFAS Factor		(OT)
3	Opportunity (O)	3,833	-0.167
4	Threat (T)	4,000	

Source: (Data Processing Results, 2026)

Meanwhile, the external environmental analysis shows an Opportunities score of 3.833 and a Threats score of 4.000. Opportunities for regional development are wide open through expert recruitment schemes, increasing GIS/mapping technical capacity, expanding partnerships with academics and the BMKG, and revising participatory zoning. However, this area faces significant external threats, including rampant anthropogenic pressures (encroachment, logging, and forest fires), inconsistent compliance by local communities, a high risk of forest and land fires due to extreme weather, and suboptimal cross-sector coordination.

The external analysis positions BTNRAW in a challenging environment where threats (4.000) slightly outweigh opportunities (3.833), producing a negative O–T index of -0.167 . This finding mirrors broader trends in tropical conservation areas, where anthropogenic pressures such as encroachment, illegal logging, and forest fires frequently outpace institutional responses (Margono et al., 2014; Purwanto, 2021). The high threat score is particularly concerning given the ecological importance of TNRAW, which encompasses mangrove, savanna, peat swamp, and lowland tropical forest ecosystems. Climate-related risks, including extreme weather and fire susceptibility (IPCC, 2022), further compound these pressures. Nevertheless, the opportunities identified—such as expert recruitment, GIS capacity building, and partnerships with academics and BMKG—represent viable pathways to strengthen resilience. The literature on co-management suggests that such partnerships can enhance both monitoring efficiency and community compliance, provided they are structured around clear roles and shared objectives (Borrini-Feyerabend et al., 2013; Berkes, 2009). Thus, while the external position is unfavorable, the available opportunities, if strategically leveraged, can help mitigate the dominant threats.

Position Index

The calculation of the internal position index using the Strength minus Weakness ($S - W$) formula yields a value of -0.381 . This negative value indicates that internal weaknesses are more dominant than strengths, so that the internal capacity of BTNRAW in carrying out its area management responsibilities is not yet optimal. The results of the IFAS calculation indicate that BTNRAW requires comprehensive internal improvement efforts to increase the responsibility of area management. Improving human resource capacity, optimizing supervisory infrastructure, and strengthening institutional coordination are important aspects that must be prioritized in future management strategies.

Meanwhile, the EFAS index calculation using the $O - T$ (Opportunities minus Threats) formula produces a value of -0.167 , which indicates that external threats are more dominant than available opportunities. This negative index value indicates that BTNRAW is in an external environment full of risks and requires a defensive strategy and strong institutional responsibility to maintain the stability of area management. The results of the EFAS confirm that BTNRAW's responsibility is greatly influenced by fluctuating and stressful external conditions. The Rawa Aopa Watumohai National Park Office is required to strengthen the area's monitoring system, increase collaboration with stakeholders, expand community empowerment

programs, and develop mitigation strategies against ecological and spatial threats. Rangkuti (2018) emphasized that the appropriate strategy in conditions like this is the WT (Weakness–Threat) strategy, which focuses on protecting the organization and increasing internal capacity to face external dynamics.

When compared to the Management Effectiveness Tracking Tool (METT) assessment framework from IUCN and WWF (Hockings et al., 2006; Stolton & Dudley, 2016), the evaluation results at Rawa Aopa Watumohai National Park (TNRAW) show an imbalance between management aspects. In terms of planning and framework, TNRAW is quite good because it has a clear legal basis, zoning determination, and a community empowerment work plan. However, the main weakness is seen in the availability of resources (inputs). The number of field officers in TNRAW is very limited, namely only 17 people to oversee an area of approximately 109,514 hectares (an average of 1 officer guards $\pm 6,442$ hectares). This number is far from the ideal requirement of ± 230 people. In addition, the available operational budget is also relatively small, namely around IDR 200,000 per hectare per year.

This issue of limited staff and budget is also experienced by many large national parks in Indonesia, such as Lore Lindu National Park and Wasur National Park (Suryadi et al., 2021; Purwanto, 2021). Limited facilities and field personnel often result in uneven monitoring, leaving the area vulnerable to encroachment and forest fires (Abdullah, 2022; Margono et al., 2019). However, the National Parks and Wildlife Conservation Agency (TNRAW) is able to address these deficiencies by utilizing monitoring technology (Sipongi, GPS, and drones) and by establishing partnerships with local communities, such as the Fire Awareness Community group and the Bina Cinta Alam education program. This collaborative community management model has been shown to assist managers in protecting the area and reducing the potential for land-use conflicts (Borrini-Feyerabend et al., 2013; Kurniawan, 2019; Suharsono, 2020).

Based on the evaluation matrix calculation, the internal position index (S – W) value was obtained at -0.381 and the external position index (O – T) value was -0.167 . The negative coordinate results on both axes place the organization in Quadrant IV (Defensive / Turnaround Strategy). This position indicates that the current condition of the organization is at a high level of vulnerability, where unresolved internal weaknesses are directly exposed by high external threats. Therefore, policy recommendations are prioritized in Strategy WT (Weaknesses–Threats). The orientation of improvements is directed at efficiency and strengthening internal capacity, improving institutional governance, role division in cross-sector partnerships, and mitigating the risk of anthropogenic conflict in order to maintain the sustainability of the region's functions comprehensively.

The placement of BTNRW in Quadrant IV (Defensive/Turnaround) of the SWOT matrix carries significant strategic implications. A negative internal index (-0.381) combined with a negative external index (-0.167) indicates that the organization is simultaneously vulnerable from within and exposed to external pressures. This position necessitates a WT strategy that focuses on minimizing weaknesses and avoiding threats (Rangkuti, 2018; David & David, 2017). In practice, this means that before pursuing ambitious expansion or development goals,

BTNRAW must first stabilize its internal foundations: filling critical staffing gaps, securing adequate operational funding, and clarifying institutional mandates. Such internal strengthening is not merely administrative; it is a precondition for effective responses to external threats. Comparative studies of Indonesian national parks, such as Lore Lindu and Wasur, reveal similar patterns where limited field capacity correlates with higher rates of encroachment and fire incidents (Suryadi et al., 2021; Purwanto, 2021). Therefore, the turnaround strategy should be understood as a necessary phase of institutional consolidation, enabling BTNRAW to transition toward more proactive and adaptive management in the future.

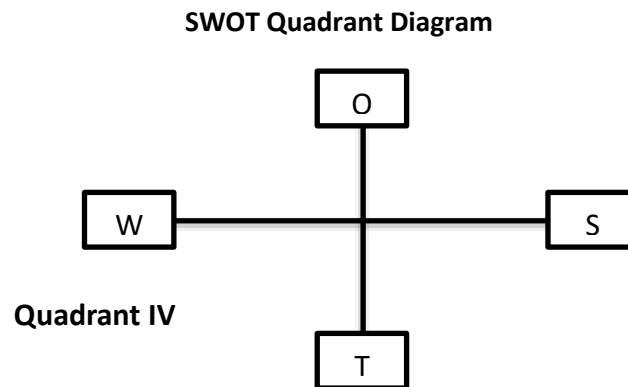


Figure 2: Strategic Implications and SWOT Quadrant Position

The first step in this strategy is to address internal weaknesses, such as the limited number of extension workers, the lack of use of monitoring technology, and the suboptimal capacity of community institutions. Addressing internal weaknesses is crucial because without strong internal preparedness, organizations will struggle to adapt to complex external dynamics (David & David, 2017). Efforts to improve competency, reorganize extension worker work areas, and strengthen coordination structures with community groups can be the main foundation for improving overall internal performance.

Furthermore, the WT strategy also directs organizations to minimize external threats and risks. Threats such as conflicts over land use, potential violations of area utilization, and pressures on ecosystems need to be mitigated with a more structured approach. This aligns with the IUCN (2020) recommendation that strengthening governance and monitoring systems is a key element in reducing long-term threats to conservation areas. Developing standard operating procedures (SOPs) for manual monitoring in extreme conditions, improving licensing procedures, and strengthening forest farmer group institutions are strategic steps to reduce external risks that could hinder effective area management.

Thus, the turnaround approach and WT strategy provide policy direction that focuses on both internal restructuring and controlling external threats simultaneously. This approach is not merely defensive but also serves as a crucial foundation for building more adaptive, responsive, and sustainable organizational capacity to address the challenges of conservation area management.

A critical element of the turnaround strategy is the development of adaptive management capacity, particularly in data management and reporting. The study

notes that digital reporting systems and zoning implementation remain suboptimal, which constrains the organization's ability to monitor outcomes and adjust strategies in real time. This aligns with the METT framework's emphasis on the 'process' and 'output' elements of management effectiveness (Hockings et al., 2006; Leverington et al., 2010). Without reliable data on patrol coverage, threat incidents, and community compliance, BTNRAW cannot accurately evaluate the impact of its interventions or allocate resources efficiently. Strengthening the Sipongi system, integrating drone and GPS data into a centralized database, and training staff in data analysis would enhance both accountability and responsiveness. Furthermore, cross-sector coordination with agencies such as BMKG for early fire warning and with local governments for zoning enforcement is essential to reduce external risks (Pramudya et al., 2020; Abdullah, 2022). These measures, while seemingly technical, are fundamental to building the institutional resilience required for long-term conservation success.

This study has several limitations that should be acknowledged. First, the analysis relies on five key informants and document review, which may not capture the full diversity of perspectives within BTNRAW or among local communities. Second, the IFAS and EFAS weighting and rating process, while validated by experts, inherently involves subjective judgment. Third, the study does not include independent ecological or socio-economic data to verify the reported threats and management outcomes. Fourth, the SWOT analysis provides a snapshot at a specific point in time, whereas management effectiveness is dynamic and influenced by seasonal and political cycles. Future research could address these limitations by incorporating larger sample sizes, longitudinal data, and spatial analysis of land cover change. Despite these constraints, the findings offer a structured and evidence-based assessment that can inform strategic planning and priority setting for TNRAW.

CONCLUSION

This study shows that the effectiveness of the Rawa Aopa Watumohai National Park (BTNRAW) management remains a significant challenge. While the agency possesses strengths in the form of competent extension workers, community empowerment experience, supporting technology, and a robust partnership network, internal weaknesses such as limited personnel, technical capacity, infrastructure, and budget remain predominant. This is reflected in the higher weaknesses score compared to strengths.

Externally, BTNRAW offers significant opportunities through government policy support, potential ecotourism development, research collaboration, and strengthening community participation. However, these opportunities are insufficient to offset the significant threats it faces, such as low compliance with the PKS (Working Permit), socio-economic pressures on surrounding communities, fire risks, illegal activities, and vulnerability to climate change.

These internal and external conditions place BTNRAW in a position requiring a turnaround strategy and a defensive approach (WT). Internal improvement efforts through human resource development, infrastructure improvements, strengthening community institutions, and enhanced cross-sectoral monitoring and coordination

are key. With these improvements, BTNRAW's accountability can be enhanced, and area management can be more effective, adaptive, and sustainable.

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