Chapter

Forest Conservation Management Using SWOT Analysis and QSPM Matrix (Case Study in the Baluran National Park, East Java, Indonesia)

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Abstract

The Quantitative Strategic Planning Matrix (QSPM) has been succeeded and implemented by the Baluran National Park (BNP) managers as an institution strategy. This study wants to discuss the internal and external factor evaluation and the priority strategy analysis of forest conservation management using a survey method with collection of data by a questionnaire with a proportional random of 170 respondents of households. They are 120 as a member of Forestry Community. Training Center and 50 respondents of local government and staff of BNP. Priority strategy analysis consists of (1) optimizing the public participation to save the natural tourism, (2) the transparency and accountably to maximize the conservation effort and the implementation of sustainable tourism, and (3) optimization the resources as a tourist attraction. The practical implications are provided information to a manager or related parties of the importance of internal and external factors that affect the success of management strategy plan. Originalities of this research are the internal and external factors, performing plotting on a matrix internal-external, as well as considering and comparing the external and internal factors in the SWOT matrix. The results can be taken by a decision in the formulation of priority strategies by using analysis of QSPM.

Keywords: forest, conservation, management, quantitative strategic planning matrix

1. Introduction

According to [1], National Park is a conservation area that has different types of flora and fauna that can be relied upon to ensure the survival of human beings in the present and in the future. Refs. [1, 2] indicated that almost of the protected areas face threats and interference in the form of encroachment and illegal cultivation is increasing from time to time. Refs. [1, 3] also stated that the reason of threats and disturbances in the conservation area: (1) because of the institutional role of National Park are still weak in increasing the public participation; (2) the level of

public awareness is still low against the values of environmental conservation; (3) the level of education or knowledge are still low; (4) the lack of agricultural land; and (5) isolated villages around the conservation areas.

Darusman [4] says there are at least four reasons why the public participation is very important in the national park management paradigm: (1) the public participation is an integral part of the National Park ecosystem; (2) public participation is a very large part of the subject and object of development in Indonesia; (3) public participation is a party and has been marginalized by development; and (4) public participation is an enormous strength and significantly either positively or negatively to the presence of the National Park conservation area.

Baluran National Park can be developed: (1) as a tourism activities based on natural resources, organized with following the principles of ecotourism to minimize the impact of tourism activities, (2) encourage the conservation of National Park, (3) stimulate economic growth of local people, and (4) provide experiences and conservation education for tourists.

Forest Conservation Management Benefits are able to (1) improve quality and quantity of timber; (2) reduce soil erosion; (3) improve water quality; (4) provide wildlife habitat; (5) sequester carbon in the soil; (6) increase energy source of biomass; and (7) reduce forest health risk of pests and invasive species [5, 6].

Refs. [5, 6], also gives some recommendations of forest management plan, include the need for a supporting institutional, legal, and policy framework that is not just different but more dynamic, to facilitate resource management adaptation and preparedness in a period of accelerating environmental change.

According to the State of The World's Forests [7], "Sustainable forest management", "ecologically sustainable forest management", "forest ecosystem management", the "ecosystem approach" to forest management and "systemic forest management" are among the many terms used to describe concepts and practices that incorporate the three pillars of sustainable forest management – economic, environmental and socio-cultural aspects – to varying degrees.

Singh et al. [8] state that "strategy intent and strategic mission influenced by external environment consisting of opportunities, threat or constraint, and internal environment such as strengths and weakness. The external environment was developed by external conditions such as economic trends, political or legal environment, socio-culture environment, and global environment, which is affect to the company's performance. "Singh advises to do this study by using the value chain analysis".

Some research conducted by Fries [9] stated that the strategy is influenced by variables organization are consisting of: (1) goals and values; (2) resources and capabilities; (3) structure and system; and (4) environment variable such as (i) competitors; (ii) communities; (iii) customers; (iv) government; (v) industry; (vi) institutions; (vii) interest group; and (viii) media and public.

The research of Singh et al. and Fries [8, 9] that provide a gap to be studied by using a variable internal to the organization concerning with the analysis of the value chain by Michael E Porter [10] and the external variable organization based on a research by Jochen [9].

Feurer [11] stated that there are five stages in the preparation of the strategic plan an institution, such as (1) identification and classification of the organization's resources by identifying strengths and weaknesses; (2) identifying the organizational capabilities regarding what can be done organization for more effective and efficient in the face of competitors; (3) utilize the potential resources and it is ability to manage and achieve an competitive advantage in a sustainable manner and immediately get some results; (4) choose a strategy that using the organization's resources very well and skills, also related to external opportunities; and (5) identify

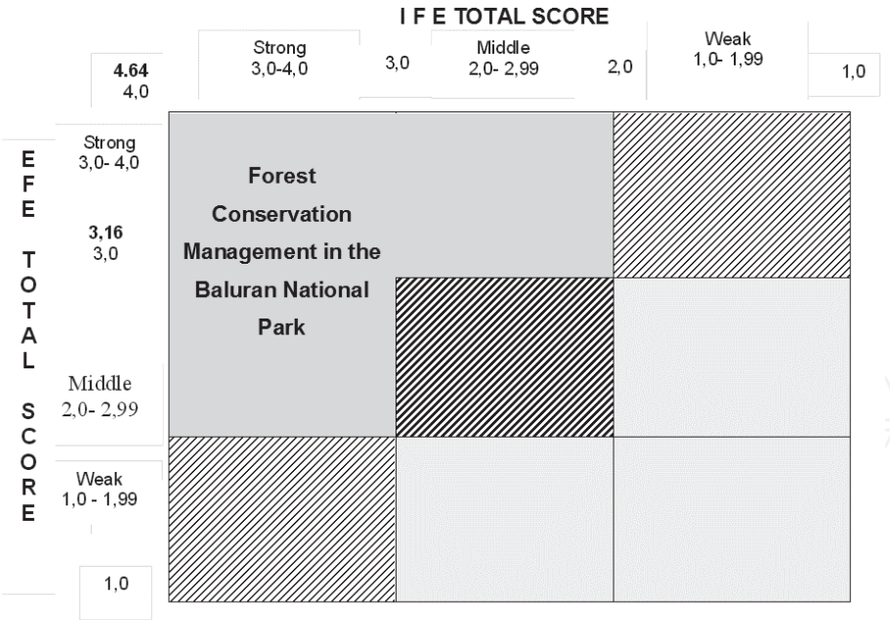

Figure 1.
Internal-external/I-E matrix Forest conservation management in the Baluran National Park Using SWOT Analysis and QSPM Matrix.

gaps of resources that need to be filled by additional investment, expand and upgrade the resource-based organization.

Koontz and Weihrich [12] state that the design stage is the establishment so many strategic plans of the mission, objectives, policies, procedures, rules, programs, and budgets, where this stage is tiered and hierarchical. The study objectives are analyze and explained by the formulation of priorities strategic of the Baluran National Park (BNP) through Quantitative Strategic Planning Matrix (QSPM).

According to Ref. [13], it is said that the Quantitative Strategic Planning Matrix (QSPM) has become widely used among strategic management professors and students for two decades. However, the Quantitative Strategic Planning Matrix (QSPM) has not been widely adopted by strategic planning consultants and organizations. Kazem Zare and Sepideh Karimi [14] also said that the Strength-Weakness-Opportunity-Threat (SWOT) analysis is a powerful strategic tool for evaluating an organization according to internal and external key factors. David and David [13] stated that analytical tools are used by the Strength-Weakness--Opportuniy-Threat (SWOT) Matrix and Boston Consulting Group (BCG) Matrix that generate strategies and it can be evaluated by a Quantitative Strategic Planning Matrix (QSPM).

According to Ref. [15] the management system in Baluran National Park separated by three zones (see **Figure 1**). Based on Director general of forest Conservation and Nature Number SK.228/IV- SET/2012 and the date in December, 26, 2012 stated that some zone in Baluran National Park has include for: (1) Zone around 6920.18 Ha (27.68%); (2) Rimba Zone around 12,604.14 Ha; (3) Advantages Zone around 1856.51 Ha (7.43%); (4) Traditional Zone around 1349,21 Ha (5.36%); (5) Zone around 738.19 Ha (2.95%); (6) Security Zone around 1174.96 Ha (4.70%); and also (7) Rehabilitation Zone around 365.81 Ha (1.46%).

2. Materials and methods

Quantitative Strategic Planning Matrix (QSPM) are (1) one of approach for strategic management at the top level to evaluate strategic opportunities; (2) a

method of analysis that compare the activity of suitable alternative strategies; (3) a method of analysis can provide for three (3) stages of strategy formulation framework analysis; (4) is an analytical tool that is able to select the best strategy objectively by using inputs and management techniques with easy computational [16].

To implement strategy forest conservation management by using Quantitative Strategic Planning Matrix (QSPM) analysis, within three stages as follows: (1) The first stage for preparing an external factors evaluation matrix (EFEM), and internal factor evaluation matrix (IFEM), (2) arrange external or internal matrix, then determines the strategy to be taken.

The sampling method is proportional random sampling and unit analysis is the heads-of-household who are members of the forestry community training center (120 people) and local government and staff of Baluran National Park with 50 people (see **Table 1**).

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No	Key external factors	Weight	Value rating	Score
Opportunities				
1	Global support to conservation of natural resources in developing countries with tremendous natural wealth	0.05	3.88	0.19
2	Communication is getting better and coordinated between the parties	0.09	3.40	0.31
3	Policy budget resource management and transparency	0.12	2.84	0.34
4	BNP located in geographical zones that are growing rapidly	0.07	3.28	0.23
5	The Minister of forestry policies are encouraging management programs and development	0.07	3.32	0.23
Threats				
1	Population growth around buffer village of BNP with the space requirements and ever increasing economic	0.14	3.04	0.43
2	The global economic downturn and the availability of jobs	0.09	3.28	0.30
3	Growth objects and attractions around BNP	0.12	2.76	0.33
4	The behavior of tourists and residents in the area of BNP uncontrolled, potentially causing damage to forests	0.09	2.96	0.27
5	The rise of rare flora and fauna trade that affect the extraction of natural resources	0.03	3.68	0.11
6	Local government policies that are inconsistent as influenced by economic and political dynamics	0.13	3.32	0.43
7	Growth objects and attractions around BNP	0.12	2.76	0.33
	Total	1.00	—	3.16

Table 1.
The external factor evaluation (EFE) matrix.

3. Results and discussions

3.1 The External Factor Evaluation Matrix (EFEM)

The steps must be carried out by other agencies or managers to implement the strategy of forest management using by analysis Quantitative Strategic Planning Matrix (QSPM) within three stages as follows: (1) The first stage for preparing an evaluation matrix external factors (EFE), and internal factor evaluation matrix (EFI), (2) arrange external or internal matrix form (EI), then determines the strategy to be taken. External factors are outside the organization that affect to the successful of forest management, and may be divided into opportunities as the external factors that it can encourage a successful management of BNP, and threats from outside the organization as a factor, it has also been increase the risk of failure to achieve management goals. The matrix evaluation of external factors is influence to the management strategy of Baluran National Park (BNP) is presented in **Table 1**.

Note that there are five opportunities and six threats facing by Baluran National Park (BNP). Fifth opportunities include (1) the existence of global support to conservation of natural resources in developing countries with a wealth of outstanding natural, (2) the communication is getting better and coordinated between the parties, (3) Policies institutional accountable and transparent in the management of budget and resources, (4) Baluran National Park (BNP) lies in the geographical zone that is growing rapidly, (5) the policy of the Ministry of Forestry are encouraging management programs and development.

While the six threats faced by manager of Baluran National Park (BNP) are: (1) the population growth around Baluran National Park (BNP) with space requirements and economic growth (2) the global economic downturn and job availability, (3) Growth of object and tourist attractions around Baluran National Park (BNP) not able to provide incentives and to improve a welfare of the surrounding community, (4) behavior of tourists and residents in the area of BNP uncontrolled, potentially causing damage to forests, (5) the trade of flora and fauna that affect extraction of natural resources of Baluran National Park (BNP), and (6) local government policies that are inconsistent as influenced by economic and political dynamics. The weight and value given to each of the external factor is based on the same criteria as is done in EFE. EFE matrix analysis results showed that the total value is multiplied by the weight to the overall external factor is 3.16.

The analysis of the internal factors that influence the forest management indicates that there are seven strengths and nine weaknesses that affect the performance of forest management. Seventh strengths are: (1) biological and non-biological diversity; (2) sustainability empowerment program with potential ownership of social assets that have the support of various parties; (3) Buffer zone (Bitakol) entrance area as a Baluran National jungle zone; (4) the relationship between Baluran National Park (BNP) with local people are good enough; (5) the relationship and coordination with the local government runs well; (6) training to improve quality of human resources of Baluran National Park (BNP) good, this is indicated partly by the success of the staff who pass the competency of performance; and (7) the wealth of biodiversity is able to attract the attention of the academics to conduct a study and research.

Internal weaknesses are internal factors in forest management that affect forest management organization to reach a destination that has been set. The results of the analysis of internal factors indicate nine weakness in forest management, namely: (1) the amount of the area has been disturbed habitat for the invasion of exotic species; (2) disturbance forests increasingly high due to the lack of participation and

awareness; (3) resource management wizard which has not been optimal so it is not able to provide benefits in improving the welfare of the surrounding community; (4) enforcement of tourist activity that has not been done properly; (5) law enforcement is not optimal and transparent; (6) the conservation efforts Bull have not shown optimal results; (7) the interaction of people still harm the BNP based on characteristic of the socio-demographic aspects; (8) many memorandum of understanding (MOU) has not been implemented optimally; and (9) unavailable the road map of research, so the research focused on the needs of researchers and research objects.

The weight of each internal factor indicates the importance of each factor in forest management. Figures weights between 0.0 indicate that these factors are not important up to 1.0 indicating that the weights are very important and affect the success of forest management. Grades or rankings indicate how effective the strategy of forest management set will increase the internal strength or overcome internal weaknesses that exist. Based on the analysis of EFI is known that the total amount is 4.64. It means Baluran National Park has good potential internal factors (**Table 2**).

No	Key Internal Factors	Value		
		Weight	Rating	Score
Strengths				
1	Biodiversity complex	0.09	4	0.34
2	Sustainability programs related to community empowerment which received support from various parties	0.15	3	0.46
3	Ex buffer zone (Bitakol) sign BNP area as jungle zone	0.09	3	0.28
4	Good relations with community institutions	0.07	3	0.23
5	Liaison and coordination with the local government goes well	0.06	3	0.20
6	BNP good in human resources, who pass the competency performance	0.14	3	0.40
7	The biological wealth to attract the attention of academics to conduct a study and research	0.10	3	0.30
Weaknesses				
1	Many areas have been impaired due to the invasion of exotic species habitat	0.07	3	0.24
2	Major anthropogenic disturbances	0.13	3	0.33
3	Resource management wizard that is not optimal	0.07	3	0.22
4	Enforcement of the rules of tourism activities that have not enforced properly	0.08	3	0.26
5	Law enforcement is not optimal	0.05	4	0.18
6	Bull conservation efforts have not shown optimal results	0.14	3	0.40
7	Community interaction (people) still hurt BNP	0.10	3	0.30
8	The amount of the memorandum of understanding (MOU) has not been implemented to the fullest	0.07	3	0.23
9	Road map research activities unavailable, so the research focused on the needs of researchers and research objects	0.09	3	0.28
	Total	1	-	4.64

Table 2.
The Internal Factor Evaluation (IFE) Matrix.

3.2 The Strength-Weakness-Opportunity-Threat (SWOT) Matrix

Based on the strengths and weaknesses found in Baluran National Park (BNP), which has been described above, it will be found through a StrengthWeakness-Opportunity-Threat (SWOT) analysis of forest management strategy to support the vision and mission. The use of Strength-Weakness-Opportunity-Threat (SWOT) analysis in this study aims to look at the feasibility of the potential of the region to be managed with public participation as the key to a successful program to create a sustainable forest management that is capable of providing independence and prosperity of society.

Strength-Weakness-Opportunity-Threat (SWOT) Matrix used is to find development options besides the main strategy that has been determined. Strength-Weakness-Opportunity-Threat (SWOT) Matrix is built based on the results of the analysis of strategic factors both internal and external factors which consist of

strengths, weaknesses, opportunities and threats. Here is a Strength-Weakness-Opportunity-Threat (SWOT) analysis matrix of Baluran National Park (BNP) (**Table 3**).

IFAS		
	Strengths	**Weakness**
	1. Biodiversity	1. A large area of habitat has been disturbed
	2. Sustainability programs related to community empowerment which receives support	2. Natural tourism is not optimal.
	3. Bitakol area as an entrance area in Baluran National jungle zone Good relationships with community institutions	3. Regulation of tourist activities not enforced properly
	4. Well−run and coordinated relationships with local government	4. Law enforcement has not been optimal.
	5. High−quality human resources	5. Bull conservation has not shown optimal results
	6. Biodiversity attracting academics to do research	6. Interactions of people still hurt BNP
		7. MOU has not been implemented
		8. No road map for researchers

EFAS		
Opportunities	**Strategy SO**	**Strategy WO**
1. Global support for conservation	Strategies that use strengths to take advantage of opportunities.	Strategies that minimize weakness in order to exploit opportuninties.
2. Improving communication	BNP forest management strategies (S 1,2,3,4,5,6,7; O 1,2,3,4,5)	The strategy of exploiting global support for the restoration of degraded areas. (W 1,2,4; O 1,2,3,4,5,6,7,8,9)
3. Resource management transparency		
4. BNP as a main corridor of the Java−Bali		
5. Encouraging management programs strategy		Utilizing the global support strategy and communication efficiency coordination to enhance tourism competitiveness BNP. (W 3,4,5,6,7,8,9; O 1,2,3,4,5)
Threats	**Strategy ST**	**Strategy WT**
1. Population growth	Strategies that use strengths to overcome threats.	Strategies that minimize weakness and avoid threats.
2. The global economic downtown	Draw up strategies for optimizing the preservation around BNP	The strategy of exploiting the objects and attractions of natural resources in transparency and accountability of management policies to maximize conservation efforts, including implementation of sustainable tourism in TN Baluran

3. The growth of tourism	BNP for the welfare of the local community	
4. The behavior of tourists and the residents.	(village buffer)	
5. The rise of the rare flora and fauna trade	(S 1,2,3,4,5,6,7; T 1,2,3,4,5,6)	(W 1,2,3,4,5,6,7,8,9; T 1,2,3,4,5,6)
6. Local government policies		

Table 3.
A SWOT matrix.

3.3 Quantitative Strategic Planning Matrix (QSPM)

The last stage prioritization strategy that should be taken in the management of Baluran National Park (BNP) which is capable of improving the sustainability of economic, ecological and social is the analysis of Quantitative Strategic Planning Matrix (QSPM). Each strategy was analyzed to determine its ability to improve the internal strength to take advantage of existing opportunities, as well as to overcome

Key Factors	Weight	Alternative					
		Strategy 1		Strategy 2		Strategy 3	
		AS	TAS	AS	TAS	AS	TAS
Opportunities							
Global support to conservation	0.05	4	0.55	4	0.56	4	0.52
Communication is getting better	0.09	3	0.45	3	0.45	3	0.45
Resource management transparency.	0.12	3	0.34	3	0.35	3	0.35
BNP as a main corridor of the Java-Bali.	0.07	3	0.10	3	0.32	3	0.31
Encouraging management programs	0.07	3	0.30	3	0.30	3	0.10
Threats							
Population growth	0.14	3	0.10	3	0.09	3	0.29
The global economic	0.09	3	0.23	3	0.20	3	0.25
Growth objects and attractions around BNP.	0.12	3	0.32	3	0.40	3	0.24
Behavior of tourists and residents	0.09	3	0.40	3	0.40	3	0.23
The rise of rare flora and fauna trade	0.03	4	0.05	4	0.05	4	0.15
Local government policies	0.13	3	0.10	3	0.10	3	0.10
	1.00						
Strengths							
Biodiversity complex	0.09	4	0.40	4	0.20	4	0.50
Sustainability programs received support	0.16	3	0.35	3	0.30	3	0.35
Bitakol area sign BNP area as jungle zone.	0.09	3	0.09	3	0.06	3	0.20
Relationships with community institutions well	0.08	3	0.08	3	0.03	3	0.15
Relationship and coordination running properly.	0.06	3	0.12	3	0.08	3	0.10
Human Resources very well	0.06	3	0.28	3	0.28	3	0.08
Biodiversity attract academics to do research	0.03	3	0.10	3	0.10	3	0.05
Weaknesses							
A large area of habitat has been disturbed	0.07	3	0.28	3	0.34	3	0.40
Natural tourism is not optimal.	0.03	3	0.45	3	0.40	3	0.18
Tourist activities not enforced properly.	0.07	3	0.06	3	0.06	3	0.06
Law enforcement has not been optimal.	0.08	3	0.04	3	0.04	3	0.04
Bull conservation not shown optimal results	0.02	4	0.12	4	0.12	4	0.12
Interaction people still hurt BNP	0.04	3	0.04	3	0.05	3	0.03
MOU has not been implemented	0.01	3	0.31	3	0.32	3	0.33
No road map for researchers	0.02	3	0.10	3	0.06	3	0.06
	1.00		5.79		5.82		5.80

Table 4.
Quantitative Strategic Planning Matrix Applied to Forest Conservation in Baluran National Park.

internal weaknesses by controlling the threat to be faced. In the analysis of Quantitative Strategic Planning Matrix (QSPM), that this capability is also called the appeal. Rated appeal is 1–4, where 1 = not attractive, 2 = somewhat attractive, 3 = quite interesting, and 4 = very interesting.

Research results indicate by optimizing resource of destinations and tourist attractions is 5.79 (**Table 4**). Strategies to increase public participation in the management of natural tourism is 5.82, the value strategy utilizing management policies are transparent and accountable to maximize conservation efforts, including the implementation of sustainable tourism is 5.80.

Priority strategies based on the analysis Quantitative Strategic Planning Matrix (QSPM) specified three priorities that have a total value attractiveness score (TAS) is highest include (1) increasing public participation in the management of natural tourism, (2) utilizing the management policy that is transparent and accountable to maximize efforts conservation, including the implementation of sustainable tourism, and (3) optimizing resources destinations and attractions Baluran National Park (BNP).

4. Conclusions

Developing a Quantitative Strategic Planning Matrix (QSPM) makes it less likely that key external/internal factors will be overlooked or weighted inappropriately in deciding which alternative strategies to pursue. Although developing a Quantitative Strategic Planning Matrix (QSPM) requires a number of subjective decisions, making small decisions along the way enhances the probability that the final strategic decisions will be best for the firm.

As evidence for the Baluran National Park (BNP) examined in this paper, the Quantitative Strategic Planning Matrix (QSPM) can be a useful strategic planning tool even for small firms. Priority strategies based on the analysis Quantitative Strategic Planning Matrix (QSPM) which include (1) increasing public participation in the management of natural tourism with a value of 5.82; (2) utilizing forest management policies are transparent and accountable to maximize conservation efforts, including the implementation of sustainable tourism in TN Baluran with a value of 5.80; and (3) optimizing resources destinations and attractions with a value of 5.79.

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