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Feasibility Analysis of Naval Base Relocation Using SWOT and AHP Method to Support Main Duties Operation

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Abstract

Naval base as part of integrated fleet weapon system has an important role in maintaining the strategic environment in the region of Indonesia. Naval base with a strategic location will support Indonesian navy's main duty to carry out the administrative and logistical support. Due to the limitation of naval base's condition, feasibility study will be required to relocate the naval base. In this feasibility study, a combination of methods between SWOT analysis and Analytical Hierarchy Process (AHP) is used. The results of the Internal Factors Evaluation (IFE) matrix analysis is 4.72 and External Factors Evaluation (EFE) matrix analysis is 2.91. In general, the balance of power between the IFE Matrix and EFE Matrix is located in quadrants I and thus, the aggressive strategy is supported. While the matrix analysis' result of Internal-External (IE) showed that the score of IFE and EFE located in quadrant II and VII.

Keywords: Feasibility study; Naval base; SWOT; AHP

Introduction

Indonesia is a maritime country comprising over 17.000 islands. It is located between the Pacific and Indian Oceans and links Asia land with the Pacific world (Figure 1) [1]. The geo-strategic of Indonesian is a potential tool to controls several critical paths across the oceans in the world [2]. Under the changing circumstances of operational environment and in the face of new security environment which is more complex and ambiguous than before, modern armies have started to look for alternatives or better options to surpass the challenge of transition in the new era [3]. The prospect of declining budgets and the changing geostrategic environment had also urged the Navy to change its strategy decision [4].

Therefore, to protect Indonesia's marine territory, Indonesian Navy holds a program to strengthen the defense with the integrated fleet weapon system. That program consists of navy vessel, aircraft, troops (marines) and naval base. As part of integrated fleet weapon system, the naval base should be able to carry out its functions optimally to resolve cases of violations in Indonesia's marine territory [5]. One of the Indonesian navy strategic plans in the dynamics of change is to relocate the naval base into a better place because the current condition of the naval base is still lacking the ability to carry out its duties.

The feasibility study on the relocation of the naval base is carried out by doing an investigation the areas and supporting facilities in terms of technical and strategic aspects along with interviewing Indonesian navy's officer. The technical aspects of a port include Hinterland/ area of influence aspect and geography and oceanography aspect [6]. Geographically, military also considers of militarism perspective and spatial perspective [7]. This is because globalization and economic power are worthless without the existence of military [8]. A strategic position is an important element for the operation of a concept [9]. Strategic Decisions (SD) are made based on the special characteristics of the decision (both the perceived characteristics and typology objectives strategic decisions) which is part of the management leadership characteristics and has contextual factors refer to the external and internal environment [10]. The purpose of this feasibility study is to provide a more realistic perspective from key decision makers in decision making process [11]. This study is necessary to determine the effectiveness and to manage the risks of some system that will be used [12].

Therefore, this feasibility study to relocate the naval base is part of a research operation based on Multi-Criteria Decision Making (MCDM). The core of the operations research is to develop approaches for optimal decision making. A prominent class of such problems is multi-criteria decision making (MCDM). The typical MCDM problem deals with the evaluation of alternatives in a set of decision criteria [13]. One way MCDM approach is to use a SWOT and AHP analysis. The combined use of the AHP and SWOT analysis has been widely used to support strategic decision making processes [14].

SWOT analysis is an important part of feasibility study [15]. A SWOT analysis is able to identify conditions, potentials, and problems with related aspects which resulted in the decision of a number of factors or variables [16]. This combination can efficiently evaluate SWOT sub-criteria and thus give them priority in order to allow decision-makers to determine which of those should be given attention first [17]. To obtain the scale ratio from the actual measurement or the fundamental scale that reflects the relative strength, AHP method is used [18]. There are some basic principles in resolving the problems with the AHP method, namely decomposition, comparative judgment, synthesis of priority, and logical consistency [19].

By combining SWOT and AHP analysis stages, the right strategies can be determined for planning the relocation of the naval base. Furthermore, this strategic planning can be used as a tool of organization to start and manage their strategic functions of the organization [20]. This study is necessary in order for the naval base to function optimally and effectively. This study determines the strategic priorities of location and relocation of the naval base. It also provides a feasibility study for the development of naval base as a guideline in planning other naval bases and facilities in future.

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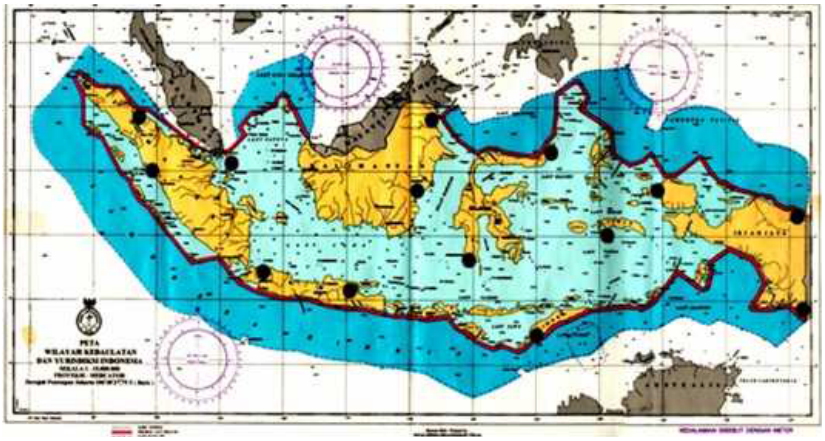

Figure 1: Map of the Indonesian naval main base.

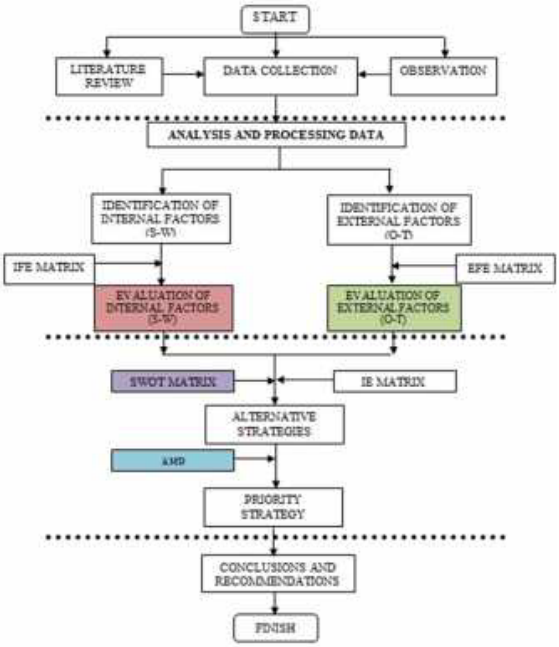

Figure 2: Research integration SWOT and AHP flowchart.

Research Methodology

SWOT and AHP integration is used for the flowchart in this research (Figure 2) [21]. SWOT provides the basic frame to perform an analysis of the decision situation, and the AHP assists in carrying out SWOT more analytical and elaborating the analysis so that alternative strategic decisions can be prioritized [22]. The aim of applying the combined method is to improve the quantitative side of strategic planning [21].

Naval base environment

Naval base is expected to be the spearhead force in carrying out the task of supporting the warships operation [23]. The main duty of the naval base is to carry out administrative and logistical support in order to develop the concept of logistics operations support [24]. The requirements of Indonesian naval base include port facility, maintenance and repair facility, supplies or logistics facility, personnel care facility, and training base facility (Table 1).

The others general environment which includes the socioeconomic, educational, legal–political, and cultural aspects, usually operates within a specific geographic area. The specific environment is comprised of the suppliers, distributors, government agencies, and competitors which a military organization should interact [25], including the effect of the population, political institutions, geo-culture, and others in determining the exact location [26].

SWOT analysis

SWOT is a method used to analyze operational environment with a systematic approach. This analysis is also utilized for strategic planning [27]. SWOT analysis is based on the logic of maximizing the strength and opportunities as well as minimizing the weaknesses and threats simultaneously [28]. SWOT analysis is obtained from the identification of the conditions, potentials and problems with aspects related to use SO (Strength Opportunity)/maxi-maxi strategy, wo (weakness opportunity)/mini-maxi strategy, st (strength threat)/maxi-mini strategy, WT (weakness threat)/mini-mini strategy (Table 2) [29].

No.	Standard bases of Indonesian navy	Basic building coefficient
Port facility	Capable in leaning all kinds of warships, at least one task force	20%
Maintenance and repair facility	Able to carry out maintenance and repairs up to the intermediate level for all types of warships both system, weapons and platform	10%
Supplies or logistics facility	Able to support class	10%
	Logistics (food, individual field equipment, tools, oils, drugs) for at least one task	
Personnel care facility	Support personnel includes: messing, medical facilities/hospital, sports and recreation facilities, religious facilities, and training facilities to at least one task force.	30%
Training base facility	The common facilities, capable of providing office facilities and infrastructure activities on the base	30%
	Freight services facilities, able to support the transport and postal personnel by land, sea and air	
	Defence base facilities, capable of providing defence and security against threats from the air, sea and land as well as infiltration/sabotage	

Table 1: Indonesian naval base standard facility.

SWOT Matrix	Strength (S)	Weakness (W)
	Positive internal aspects that can be controlled and can be strengthened in the planning.	The strategy of internal negative aspects that can be controlled and can be corrected in the planning.
Opportunity (O)	**SO strategy**	**WO Strategy**
Positive external conditions that can't be controlled and can be taken advantage.	Utilizing Internal strength to take advantage of external opportunities.	Improving internal weaknesses by taking the clappers of external opportunities
Threat (T)	**ST Strategy**	**WT Strategy**
Negative external conditions that can't be controlled and may be minimized impact.	Using force to avoid or reduce the impact of external threats	Defensive tactics directed at reducing internal weaknesses and avoid external threats

Table 2: SWOT Matrix.

Stages of AHP

Additional value from SWOT analysis can be achieved by performing pair-wise comparisons between SWOT factors and analyzing them by means of eigenvalue technique as applied in AHP means of eigenvalue technique as applied in AHP [29]. Relative importance weights of the SWOT factors and sub-factors were obtained by Analytic Hierarchy Process (AHP) model, as well as the ranking of identified strategies. It was performed by several experts [30]. The stages of decision-making with AHP method are as follows:

1. Define problems and determine solutions.

2. Creating a hierarchical structure.

3. Pairwise comparison matrix formed by choice or judgment of the decision maker to assess the level of importance of an element than any other element.

4. Normalize the data.

5. Calculating eigen values vector and tested for consistency.

6. Repeat steps 3, 4, and 5 for all levels of hierarchy.

7. Calculating eigen vector of each pairwise comparison matrix.

8. Test the consistency of the hierarchy in the form of relationship priorities as eigen vector against consistency.

If that assessment is perfect in any comparison, *aij.ajk* = *aik* then for all, and *A* matrix is called consistent (21).

$$A=\begin{bmatrix} 1 & a_1 & \cdots & a_1 n \\ \frac{1}{a_{1n}} & 1 & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{1}{a_{1n}} & \frac{1}{a_{2n}} & \cdots & a \end{bmatrix}$$

The values of the comparison matrix A can be expressed into the following forms:

$$a_i = \frac{w_i}{w_j};\ (i, j = 1, 2, 3, \ldots n) \tag{1}$$

$$a_i . \left(\frac{w_i}{w_j}\right) = 1; (i, j = 1, 2, 3, \ldots, n) \tag{2}$$

Consequences:

$$\sum_{j=1}^{n} a_i . w_j . \left(\frac{1}{w_i}\right) = 1; (i = 1, 2, 3, \ldots n) \tag{3}$$

$$\sum_{j=1}^{n} a_i . w_j . \left(\frac{1}{w_i}\right) = n w_i; (i = 1, 2, 3, \ldots n) \tag{4}$$

Equation (4) in the form of a matrix becomes:

$$\mathrm{A} . \mathrm{w} = \mathrm{n} . \mathrm{w} \tag{5}$$

If Z_1, Z_2, Z_3, ..., Zn are numbers that is in accordance with equation *A.w = Z.w* (*Z* is eigen value of the matrix, and if= 1 to *i*) then an equation becomes

$$\sum_{i=1}^{n} Z_i = n \tag{6}$$

if is a pairwise comparison matrix, to obtain the priority should be sought *W* vector satisfying the equation

$$A = Z_m . w \tag{7}$$

Indicators of consistency measured using Consistency Index (CI) were formulated

$$C = \frac{Z_m - n}{n - 1} \tag{8}$$

n	1	2	3	4	5	6	7	8	9	10	11	12	13
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.54	1.56

Table 3: Random Index (RI).

No	Internal criteria	Total count
	Strengths	
S.1	Policy	52
S.2	Main duties naval base	48
S.3	General requirements of naval base	47
S.4	Availability of logistics region	47
S.5	Topography	47
S.6	Classification of naval base	47
S.7	Function of naval base	47
S.8	Personnel readiness	47
	Weaknesses	
W.1	Areas of operation	44
W.2	Supporting facilities	43
W.3	Layout design	43
W.4	Geology	42
W.5	Availability of shipyard	40
W.6	Availability of public facilities	40
S: Strengths; W: Weaknesses		

Table 4: Internal criteria of primary data of strengths and weaknesses.

No	External criteria	Total count
	Opportunities	
O.1	Regional spatial	48
O.2	Availability of land	47
O.3	Oceanography	47
O.4	Sedimentation	47
O.5	Geostrategic and geo-economy	47
O.6	Unit support	45
O.7	Availability of public pier	44
	Threats	
T.1	Community support	38
T.2	Sailing volume	38
T.3	Road access	38
T.4	Supporting facilities	36
T.5	Level of insecurity	28
O: Opportunities; T: Threats		

Table 5: External criteria primary data of opportunities and threats.

And for measuring the consistency of assessment is used Consistency Ratio (CR)

$$C = \frac{C}{R} \tag{9}$$

A certain level of consistency is required in determining the priority to obtain valid results. CR value should not be more than 10% or 0.10. If not then need to be revised (21). Random Index (RI) value can be seen in the following Table 3:

Numerical Calculation Result

SWOT data processing in primary data collection is done by interviewing officer of Indonesian naval base facilities services, hydro-oceanographic office and naval expertise competence. The results of the interview data were processed by expert choice software into criteria and weighting data in accordance with the numerical calculation (Tables 4 and 5).

Weight determination and critical value

Data processing in critical weight determination and value at AHP SWOT performed using expert choice software. Furthermore, the data was presented in excel format to determine the criteria for scale rating score (Table 6).

Internal factors evaluation (IFE) matrix analysis: From the analysis above, the score of 4.72 was relatively obtained. This result was ranging in the scale of 4 and indicates that these factors are very strong in influencing internal factors of naval base relocation (Table 7).

External factors evaluation (EFE) matrix analysis: From the analysis above, the score of 2.91 was obtained. This result is ranging in the scale of 3, indicating that these factors had a higher response above than the average in influencing external factors of naval base relocation (Table 8).

Sensitivity analysis

A sensitivity AHP analysis on the weight of the priority criteria can determine the order of priority strategy. Dynamic graph sensitivity can also be characterized as in the Figures 3 and 4 below.

From the condition above, the priority strength was 33.7% and in those conditions, the global priorities of strength were 33.7%, then weaknesses 29.5%, opportunities 22.3% and threats 14.6%.

Discussion

The formulation of the strategic priorities from IFE and EFE matrix results, it is showed that the intersection of the four lines namely strength, weaknesses, opportunities and threats factor are as follows (Figures 5 and 6):

scores strengths-weaknesses score=2.45 to 2.27=0.17

scores opportunity-threat score=1.71 to 1.20=0.51

In the chart above, the data were obtained through EFI and EFE matrix. The strength comparison stands in quadrant I and it supports the aggressive strategy (Table 9). It is depicted in the graph below:

Priority strategies

S-O strategy was selected as a priority strategy to relocate the naval base (Figure 7). This strategy can succeed by preparing the location details in advance. Furthermore, the implementation of the relocation of the naval base implemented according to plan with the support of local topography and oceanography state.

Conclusion

In this paper, we have determined the strategic factors significant to relocate naval base by combining the SWOT method with AHP technique. strength and opportunities (S-O) strategy is a strategic priority to support the relocation of the naval base. So that the main duties of the naval base can be successful, especially for warships operation in the Indonesian territory. Chart analysis of IFE and EFE matrix shows that the strategy is in quadrant I, which supports an aggressive strategy by leveraging existing strengths and opportunities. Expectations of future research on any MCDM techniques also can use CBA (Cost Benefit Analyze) method to determine the cost of relocating naval base.

Acknowledgement

This research has been supported by Indonesia Naval Technology College (STTAL) and Indonesian Naval Base Facilities Services.

SWOT groups	Importance of the SWOT criteria	SWOT sub-criteria	Local importance of SWOT sub-criteria	Weight total (N)	Score (J)	Rating score (N) × (J)
Strengths (S)	0.337	Policy	0.239	0.081	52	4.19
		Main duties naval base	0.157	0.053	48	2.54
		General requirements naval base	0.147	0.050	47	2.33
		Availability of logistics region	0.123	0.041	47	1.95
		Topography	0.109	0.037	47	1.73
		Classification of naval base	0.087	0.029	47	1.38
		Function of naval base	0.081	0.027	47	1.28
		Personnel readiness	0.058	0.020	47	0.92
		Total	1.00	0.337		
Weaknesses (W)	0.295	Areas of operation	0.244	0.072	44	3.17
		Supporting facilities	0.202	0.060	43	2.56
		Layout design	0.182	0.054	43	2.31
		Geology	0.140	0.041	42	1.73
		Availability of shipyard	0.122	0.036	40	1.44
		Availability of public facilities	0.111	0.033	40	1.31
		Total	1.00	0.295		
Opportunities (O)	0.223	Regional spatial	0.228	0.051	48	2.44
		Availability of land	0.214	0.048	47	2.24
		Oceanography	0.142	0.032	47	1.49
		Sedimentation	0.126	0.028	47	1.32
		Geostrategic and geo-economy	0.123	0.027	47	1.29
		Unit support	0.085	0.019	45	0.85
		Availability of public pier	0.083	0.019	44	0.81
		Total	1.00	0.223		
Threats (T)	0.146	Community support	0.291	0.042	38	1.61
		Volume sailing	0.246	0.036	38	1.36
		Road access	0.206	0.030	38	1.14
		Supporting facilities	0.152	0.022	36	0.80
		Level of insecurity	0.104	0.015	28	0.43
		Total	1.00	0.146		

Table 6: Critical value weighting of SWOT criteria.

SWOT Groups Level 1	Internal SWOT sub-criteria	Local importance	Rating	Score (2) × (3)
	(1)	(2)	(3)	(4)
Strengths (S)	Policy	0.239	4.19	1.00
	Main duties naval base	0.157	2.54	0.40
	General requirements of naval base	0.147	2.33	0.34
	Availability of logistics region	0.123	1.95	0.24
	Topography	0.109	1.73	0.19
	Classification of naval base	0.087	1.38	0.12
	Function of naval base	0.081	1.28	0.10
	Personnel readiness	0.058	0.92	0.05
	Total	1.00		2.45
Weaknesses (W)	Areas of operation	0.244	3.17	0.77
	Supporting facilities	0.202	2.56	0.52
	Layout design	0.182	2.31	0.42
	Geology	0.140	1.73	0.24
	Availability of shipyard	0.122	1.44	0.18
	Availability of public facilities	0.111	1.31	0.15
	Total	1.00		2.27

Table 7: Internal Factors Evaluation (IFE) matrix analysis.

SWOT Groups Level 1	Internal SWOT sub-criteria	Local importance	Rating	Score (2) × (3)
	(1)	(2)	(3)	(4)
Strengths (S)	Policy	0.239	4.19	1.00
	Main duties naval base	0.157	2.54	0.40
	General requirements of naval base	0.147	2.33	0.34
	Availability of logistics region	0.123	1.95	0.24
	Topography	0.109	1.73	0.19
	Classification of naval base	0.087	1.38	0.12
	Function of naval base	0.081	1.28	0.10
	Personnel readiness	0.058	0.92	0.05
	Total	1.00		2.45

Weaknesses (W)	Areas of operation	0.244	3.17	0.77
	Supporting facilities	0.202	2.56	0.52
	Layout design	0.182	2.31	0.42
	Geology	0.140	1.73	0.24
	Availability of shipyard	0.122	1.44	0.18
	Availability of public facilities	0.111	1.31	0.15
	Total	1.00		2.27

Table 8: External Factors Evaluation (EFE) matrix analysis.

Figure 3: Dynamic graph sensitivity to goal.

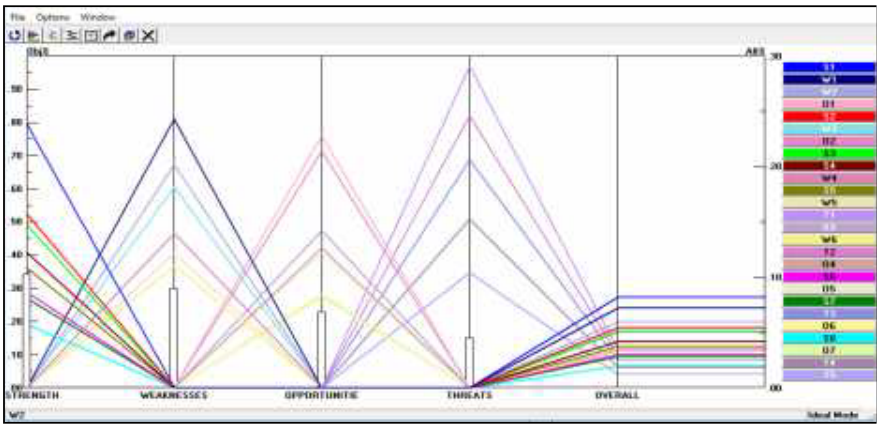

Figure 4: Performance graph sensitivity to goal.

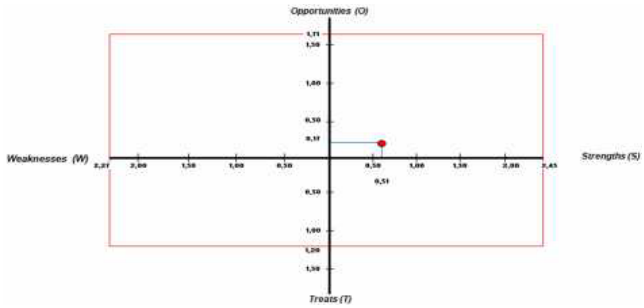

Figure 5: SWOT analysis graph.

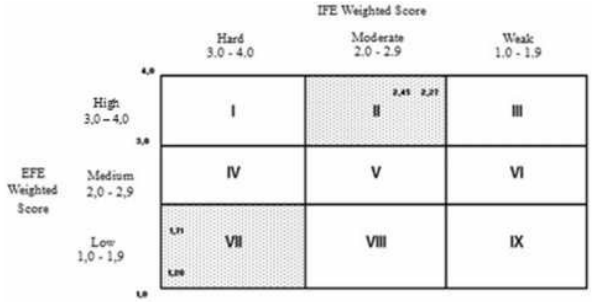

Figure 6: Matrix Internal-External (I-E) analysis.

Internal factor/External Factors	Strengths (S)	Weaknesses (W)
	Policy	Areas of operation
	Main duties naval base	Supporting facilities
	General requirements base	Layout design
	Availability of logistics region	Geology
	Topography	Availability of shipyard
	Classifications of naval bases	Availability of public facilities
	Function of naval base	
	Personnel readiness	
Opportunities (O)	**SO Strategy**	**WO Strategy**
Regional spatial	Preparation of the administration of relocation	Cooperation of area development
Availability of land	Design plan of naval base (S1)(S2)(S5)(O2)(O3)(O4)	The establishment of economic centres (W2)(W3)(O1)(O2)(O5)
Oceanography		
Sedimentation		
Geostrategic and geo economy		
Unit support		
Availability of public pier		
Threats (T)	**ST Strategy**	**WT Strategy**
Community support	Empowerment of maritime potency	Cooperation with local companies
Sailing volume	Development of the surrounding area (S2)(S7)(O1)(O2)	Utilization of the existing contour
Road access		Implementation of routine operations (W2)(W3)(W6)(T1)(T2)
Supporting facilities		
Level of insecurity		

Table 9: SWOT matrix research.

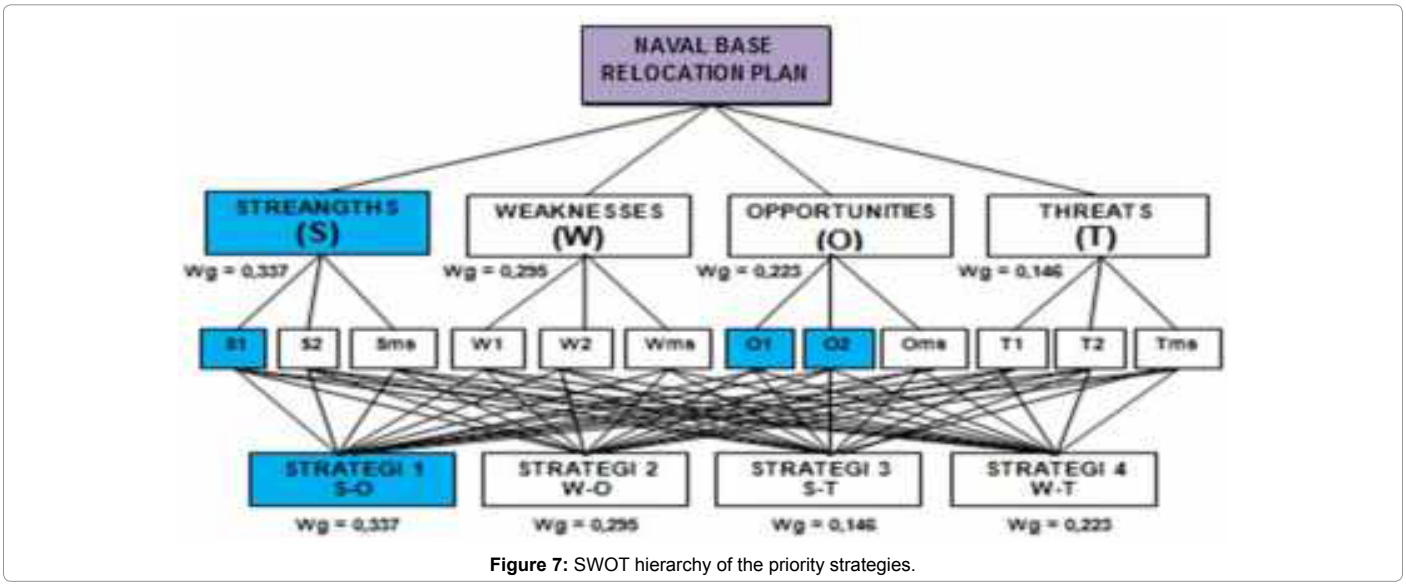

Figure 7: SWOT hierarchy of the priority strategies.

References

1. Tumonggor MK, Karafet TM, Hallmark B, Lansing JS, Sudoyo H, et al. (2013) The Indonesian archipelago: An ancient genetic highway linking Asia and The Pacific. J Hum Genet 58: 165–173.
2. RSIS Indonesia Programme (2014) Indonesia's naval development and maritime cooperation. Singapore: RSIS Policy Report.
3. Goztepe K, Dizdaroğl V, Sağıroğlu Ş (2015) New directions in military and security studies: Artificial intelligence and military decision-making process. Int J Inf Secur Sci 4: 69-80.
4. Russell JA, Wirtz JJ, Abenheim D, Young TD, Wueger D, et al. (2015) Navy strategy development: Strategy in the 21st century. Naval Research Program, California, USA.
5. Santoso P, Buda K, Masroeri, Irawan MI, Dinariyana A (2013) The Implementation of multi-attribute approach in decision-making for defense sea region models. J Theor Appl Inf Technol 54: 134-141.
6. Párragaa MM, Gonzalez-Cancelasa N, Soler-Floresa F (2014) DELPHI-SWOT tools used in strategic planning of the Port of Manta. ScienceDirect 162: 129-138
7. Rech M, Bos D, Jenkings KN, Williams A, Woodward R (2014) Geography, military geography, and critical military studies. Taylor & Francis 1: 47-60.
8. Kuzik M (2011) A Race to the top: Oil and gas exploration in the Canadian Arctic. J Mil Strat Stud 13: 1-24.
9. Manhas PS (2010) Strategic brand positioning analysis through comparison of cognitive and conative perceptions. J Econ Finance Adm Sci 15: 15-33.
10. Papadakis VM, Lioukas S, Chambers D (1998) Strategic decision-making processes: The role of management and context. Strat Mgmt Journal 19: 115-147.
11. Eisenhardt KM, Zbaracki MJ (1992) Strategic decision making. Strat Mgmt Journal 13: 17-37.
12. Lark J (2009) Risk management — Guidance for the implementation of ISO 31000. International Trade Centre, International Organization for Standardization, United Nations Industrial Development Organization. Switzerland.

13. Triantaphyllou E, Shu B, Sanchez SN, Ray T (1998) Multi-criteria decision making: An operations research approach. Encyclopedia Electr Electron Eng 15: 175-186.

14. Yavuz F, Baycan T (2013) Use of SWOT and analytic hierarchy process integration as a participatory decision-making tool in watershed management. Procedia Technol 8: 134-143.

15. Bin Y (2014) A novel method of real estate development project's feasibility research based on SWOT method and analytic hierarchy process. Int J Bus Social Sci 5: 233-237.

16. Kangas J, Kajanus M, Leskinen P, Kurttila M (2016) Incorporating MCDS and voting into SWOT – basic idea. Serbian J Manage 11: 1-13.

17. Elsheikh Y, Azzeh M (2017) Prioritize E-government strategies using SWOT-ranked voting analysis technique: The case of Jordan. Int J Comput Sci and Netw Secur 17: 1-7.

18. Saaty RW (1987) The analytic hierarchy process-What it is and how it is used. Pergamon J Ltd 9: 161-176

19. Saaty TL (1990) How to make a decision: The analytic hierarchy process. Eur J Oper Res 48: 9-26.

20. Ghorbanian MR, Amini J, Saboorifard M (2015) Evaluating and prioritizing the aspects of SWOT matrix using the statistical methods and the analytical hierarchy process (AHP) (case study: Iranian oil pipeline and telecommunication company, northwest region). J Sci Res Dev 2: 270-280.

21. Gorener A, Toker K, Ulucay K (2012) Application of combined SWOT and AHP: A case study for a manufacturing Firm. Procedia-Social Behavioral Sci 58: 1525–1534.

22. Kangas J, Pesonen M, Kurttila M, Kajanus M (2001) A'WOT: Integrating the AHP with SWOT analysis. ISAHP, Proceedings–6th ISAHP, Berne, Switzerland. pp.189-198.

23. Hozairi, Artana KB, Masroeri, Irawan MI (2012) Implementation of intelligent control for optimization of fleet placement TNI AL ships using genetic algorithm. AR Int 2: 17-30.

24. (1999) Naval expeditionary logistic: Enabling operational maneuver from the sea. Naval Studies Board, National Academy of Sciences, Washington, USA

25. Nikoua C, Moschurisb SJ (2012) Final supplier selection system in military critical items. SPOUDAI Journal 62: 28-46.

26. Flores RG, Aguilera RV (2007) Globalization and location choice: An analysis of US multinational firms in 1980 and 2000. J Int Bus Stu 38: 1-24.

27. Mobaraki O (2014) Strategic planning and urban development by Using the SWOT analysis. The case of Urmia city. Romanian Revi Region Stu 10: 47-54.

28. Ayub A, Razzaq A, Aslam MS, Iftekhar H (2013) A conceptual framework on evaluating SWOT analysis as the mediator in strategic marketing planning through marketing intelligence. Eur J Bus Social Sci 2: 91-98.

29. Wickramasinghe V, Takano S (2009) Application of combined SWOT and analytic hierarchy process (AHP) for tourism revival strategic marketing planning: A case of Sri Lanka tourism. EASTS 8: 116.

30. Nikolić D, Spasić J, Živković Z, Djordjević P, Mihajlović I, et al. (2015) SWOT-AHP model for prioritzation of strategies of the resort stara planina. Serbian J Manage 10: 141-150.