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Abstract

Indonesia has several institutions to maintain maritime defense and security, but maritime security is not only determined by the number of authorized agencies but by many factors. This study aims to assess the factors and sub-factors that affect Indonesian maritime security. To achieve the research objectives, the method used is the Analytical Hierarchy Process (AHP) with six factors and twenty-nine sub-factors. The process of collecting data through questionnaires and interviews with several experts, the results of the questionnaire were taken with a Geometric Average, after which it was calculated according to the stages of the AHP method. The findings of this study produce priority factors that affect maritime security, first are defense and security factors (0.37), second is political and legal factors (0.24), third is economic factors (0.16), fourth are technological factors (0.11), fifth are social and cultural factors (0.07) and sixth are environmental factors (0.04). The contribution of this research is a consideration for the Government to determine policies towards improving maritime security in Indonesia.

INTRODUCTION

Indonesia is one of the largest countries in the world with total land and sea area of 5,193,250 km2. This places Indonesia as the 7th largest country in the world after Russia, Canada, the United States, China, Brazil, and Australia. When compared with the area of Asian countries, Indonesia is ranked second when compared to Southeast Asian countries, Indonesia is the largest country in Southeast Asia (Bueger, 2015) (Zhou, Deng, Deng, & Mahadevan, 2017).

Besides, Indonesia is also the largest archipelago country in the world with a vast maritime territory. The coastline is around 81,000 km, Indonesia has more than 17,000 islands and its sea area covers 5.8 million km2 or around 70 percent of the total area of Indonesia. Indonesia's sea area covers 3.1 million km2 of sovereignty and 2.7 million km2 of Indonesia's Exclusive Economic Zone (EEZ), so it can be calculated that Indonesia's sea area is 65 percent of Indonesia's total area (Kadar, 2015), (Pardosi, 2016), (Laksmana, Gindarsih, & Mantong, 2018).

Therefore, Indonesia is on a strategic trade and sea transportation route, so that Indonesia has challenges in managing maritime security that includes various dimensions including defense and security dimensions (Kadar, 2015), (Setiawan, 2017), (Hozairi, Buhari, Lumaksono, Tukan, & Alim, 2018). Maritime Security is a maritime environmental condition that is free from various threats to the territorial sovereignty of Indonesia and the enforcement of national and international law aimed at ensuring the realization of Indonesia's national interests. Maritime security is formulated into four dimensions, namely: national security, economic security, human security and environmental security (Bueger, 2015), (Anwar, 2015).

Thus, to maintain Indonesia's sovereignty, maritime security needs to be a top priority. Maritime security studies and strategies to improve maritime security are urgently needed by Indonesia. Therefore, researchers conducted a study of what factors most influenced Indonesian maritime security, researchers focused on political, economic, defense & security, social & cultural, environmental and technological factors. Determination of the influential factors is taken from the book Concept of Maritime Security (Rahman, 2009) and research on analyzing opportunities and threats to Indonesia's maritime security as a result of the development of the strategic environment because all of these factors have strong relevance to Indonesia's maritime security (I Nengah Putra A, 2016).

This study aims to assess the strategic factors that influence the maritime security of Indonesia and the sub-factors that influence it. To identify the most influential factors, of course it is not easy to analyze it, it needs the right method to analyze it, one of the right methods is Analytical Hierarchy Process (AHP), AHP method is a decision-making method that takes into account qualitative and quantitative things with models The main function of a functional hierarchy is human perception (Saaty, 2008).

The decision-making process of determining the factors that affect Indonesian maritime security is not an easy task because it includes complex problems, so it requires a supportive method for analyzing to reduce the subjectivity of decision making but also must shorten the time needed for evaluation. AHP has become one of the most popular and widely used methods for group decision making which is used to analyze factors and evaluate various complex alternative criteria that involve subjective judgment (Gerdsri & Kocaoglu, 2007), (Franek & Kresta, 2014), (Erdil & Erbıyık, 2015), (Atalik & Ozdemir, 2015), (Bignon & Badri, 2019).

This paper presents the AHP calculation model for determining the most influential factors for Indonesian maritime security, the AHP modeling framework for determining factors and sub-factors is presented with a spreadsheet model to rank the factors that most influence on Indonesian maritime security (Ekawati & Muttaqien, 2013), (Warjiyono, 2015), (Arziyah, 2017). The AHP model was expanded to include a series of sub-factor rankings, sub-factor ratings, and weights for each factor transferred to a spreadsheet program that resulted in the ranking of the most prioritized factors to support decisions as a strategy to improve Indonesia's maritime security.

RESEARCH METHOD

Analytical Hierarchy Process (AHP) is a theory of measurement used to find the ratio scale, both from discrete and continuous pair comparisons. AHP decomposes complex multi-factor or multi-criteria problems into a hierarchy. Hierarchy is defined as a representation of a complex problem in a multi-level structure where the first level is the goal, followed by the levels of factors, criteria, sub-criteria, and so on down to the last level of alternatives. With hierarchy, a complex problem can be broken down into groups which are then organized into a hierarchical form so that the problem will appear more structured and systematic.

The study began by conducting interviews using questionnaires with respondents, namely several state institutions that have legal authority at sea (Indonesian Navy, Ministry of Maritime Affairs and Fisheries, Ministry of Sea Transportation, Indonesian Maritime Security Board, Indonesian National Police, and Customs). The AHP method algorithm can be explained as follows:

Step 1: Define the problem and determine the desired solution.

Step 2: Create a hierarchical structure that starts with a general goal, followed by criteria and choices.

Step 3: Make a pairwise comparison matrix that illustrates the relative contribution or influence of each element to the goals or criteria above it. Comparisons are made based on the choice or judgment of the decision-maker by assessing the importance of an element compared to other elements.

Step 4: Normalize data by dividing the value of each element in the paired matrix with the total value of each column.

Step 5: Calculate the eigenvector value and test for consistency, if it is inconsistent then data retrieval (preference) needs to be repeated. The eigenvector value in question is the maximum eigenvector value obtained.

$$CI = \frac{(\lambda_{maks} - n)}{(n-1)} \quad (1)$$

Where:
CI: consistency index,
λ_{maks}: maximum eigenvalue,
n: the many elements used,

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

Step 7: Calculate the eigenvector of each pairwise comparison matrix. The eigenvector value is the weight of each element.

Step 8: Test the consistency of the hierarchy. If it does not meet with CR < 0.100 then the assessment must be repeated.

$$CR = \frac{CI}{RI} \quad (2)$$

Where:
CR: consistency ratio,
CI: consistency index,
RI: random index,

RESULTS AND DISCUSSION

Based on a review of the 2015 Indonesian Defense White Paper document, maritime security can be influenced by several strategic factors, namely political, economic, socio-cultural, technological, environmental, and legal. Each of these factors has a strong relevance to maritime security. In each of these factors, several phenomenon variables will be selected that will be the basis for assessing the level

Table 1. The scale of Importance Rating

Relative Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to objective
3	Weak importance	Experience and judgment slightly favor one activity over another
5	Strong importance	Experience and judgment strongly favor one activity over another
7	Demonstrated importance	One activity is strongly favored and demonstrated in practice
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order of affirmation
2,4,6,8	Intermediate values	When compromise is needed between two adjacent judgments

Source: Saaty, 2008

Table 2. Random Index (n = matrix size)

n	1	2	3	4	5	6	7	8	9	10
RC	0	0	0,58	0,90	1,12	1,24	1,32	1,41	1,45	1,49

Source: Saaty, 2008

of influence of each of these factors on maritime security.

Based on the stages of the assessment of factors and sub-factors that affect Indonesian maritime security using the AHP approach, it can be arranged as follows:

The first stage is making a decision hierarchy. Based on the results of the Indonesian maritime security study, the hierarchy consists of six criteria and twenty-nine sub-criteria as shown in Figure 1. Each criterion will be compared using the AHP value scale as shown in Table 1, then comparing each of the sub-criteria that most influence the criteria.

The second stage is to make a comparison matrix between the criteria with other criteria as shown in Table 3. There are six criteria to be compared namely Politics & Law (K), economy (E), defense & security (P), social & cultural (S), environment (L), and technology (T). Based on the results of the comparison between the criteria and the results criteria seen in Table 3, the detailed explanation is as follows:

a. The comparison value for itself is 1 which means the intensity of interest is the same.
b. A comparison of K with E is 3 based on Saaty's rule that K is slightly more important than E. Then the comparison of E with K is a reflection of K with E which means 1/3 = 0.33.
c. A comparison of K with P is 1/3, meaning that P is slightly more important than K. Then the comparison of P with K is a reflection of K with P which means = 3.
d. Comparison of K with S is 3, meaning that K is slightly more important than S. Then the comparison of S with K is a reflection of K with S which means 1/3 = 0.33.
e. A comparison of K with L is 5, which means that K is more important than L. Then the comparison of L with K is a reflection of K with L which means 1/5 = 0.20.
f. A comparison of K with T is 3, which means that K is slightly more important than T. Then the comparison of T with K is a reflection of K with T which means 1/3 = 0.33.

After the comparison value is obtained, the next step is to add up the columns for each criterion.

a. The number of criteria column K values = (1.00+0.33+3.00+0.33+0.20+0.33) = 5.20

b. The number of criteria column E values
   = (3.00+1.00+3.00+0.33+0.33+0.33)
   = 8.00
c. The number of criteria column P values
   = (0.33+0.33+1.00+0.20+0.20+0.33)
   = 2.40
d. The number of criteria column S values
   = (3.00+3.00+5.00+1.00+0.33+3.00)
   = 15.33
e. The number of criteria column L values
   = (5.00+3.00+5.00+3.00+1.00+3.00)
   = 20.00
f. The number of criteria column T values
   = (3.00+3.00+3.00+0.33+0.33+1.00)
   = 10.66

Next is to form a normalization matrix by dividing the value of column by the the number of values in each column of criteria.

- K→K = 1/5.20 = 0.192
- K→E = 3/8.00 = 0.375
- K→P = 0.33/2.40 = 0.139
- K→S = 3/15.33 = 0.196
- K→L = 5/20.00 = 0.250
- K→T = 3/10.66 = 0.281

Next is to calculate the factor eigenvalue by adding the rows divided by the number of criteria.

K = (0.192 + 0.375 + 0.139 + 0.196 + 0.250 + 0.281)/6
  = 0.239

E = (0.064 + 0.125 + 0.139 + 0.196 + 0.150 + 0.281)/6
  = 0.159

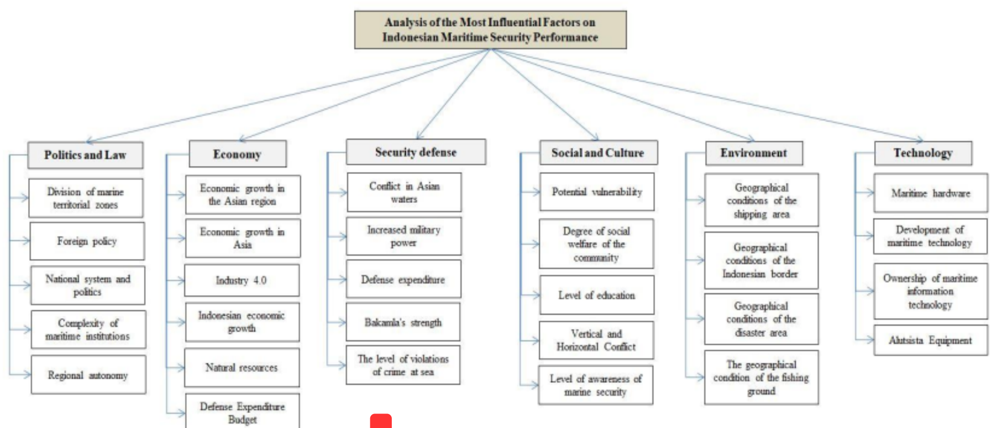

Figure 1. Hierarchy of assessment factors and sub-factors that influence maritime security
Source: Processed by Authors, 2019

Table 3. The results of the factor comparison priority values

	K	E	P	S	L	T	Priority Value	λmax	CI	CR
K	1,000	3,000	0,333	3,000	5,000	3,000	0,239	6,503	0,101	0,081
E	0,333	1,000	0,333	3,000	3,000	3,000	0,159			
P	3,000	3,000	1,000	5,000	5,000	3,000	0,371			
S	0,333	0,333	0,200	1,000	3,000	0,333	0,073			
L	0,200	0,333	0,200	0,333	1,000	0,333	0,044			
T	0,333	0,333	0,333	3,000	3,000	1,000	0,114			

Source: Processed by Authors, 2019

P = (0.577 + 0.375 + 0.417+ 0.326 + 0.250 + 0.281)/6
= 0.371
S = (0.064 + 0.042 + 0.083 + 0.065+ 0.150 + 0.031)/6
= 0.073
L = (0.038 + 0.042 + 0.083 + 0.022+ 0.050 + 0.031)/6
= 0.044
T = (0.064 + 0.042 + 0.139 + 0.196 + 0.094+ 0.684)/6
= 0.114

To test the consistency, we find the largest eigenvalue of the matrix by adding up the multiplication results of the number of columns with eigenvectors, from equation 1.

λmaks = (5.20*0.239) + (8.00*0.159) + (2.40*0.371) + (15.33*0.073) + (20.00*0.044) + (10.66*0.114)
= **6.503**
CI = (6.503-6)/(6-1)
= **0.101**
CR = 0.101/1.24
= **0.081**

After getting the consistency index value, then next look for the value of the consistency ratio (CR) by dividing the consistency index with the random consistency index (RI), as shown in equation 2. The conditions for consistency of CR <0.1 then the CR value obtained from the above comparison is consistent.

The process of calculating comparisons between criteria according to the AHP algorithm can be seen in Table 3, with the following results: first is a defense and security factor with a priority value of 0.37, second is a political and legal factor with a priority value of 0.24, third is an economic factor with a priority value of 0.16, the fourth is a technological factor with a priority value of 0.11, the fifth is a social and cultural factor with a priority value of 0.07 and the sixth is an environmental factor with a percentage value of 0.04.

The third stage is to assess the level of importance of the sub-factors that affect Indonesia's maritime security. In the same way according to the AHP method algorithm, the results of the sub-factor priority values can be seen in Table 4 to Table 9.

Political and Legal Factors (K = 0.239), political and legal conditions that occur affect the condition of Indonesia's sea security. The order of supporting factors that influence political and legal conditions, namely: first the National system and politics (K3 = 0.444), secondly the complexity of Indonesian maritime institutions (K2 = 0.165), third foreign policy (K4 = 0.127), fourthly regional autonomy (K1 = 0,200), and the fifth division of the Indonesian marine territorial zone (K5 = 0.068). In detail, the results of the priority political and legal sub-factors can be seen in Table 4.

Economic Factors (E = 0.159), Indonesia's economic condition is very influential on the condition of Indonesia's sea security. The order of supporting factors that affect economic conditions, namely: first Indonesia's economic growth (E4 = 0.363), second defense spending budget (E1 = 0.190), third Asian economic growth (E2 = 0.190), fourth ASEAN economic growth (E5 = 0.121), fifth natural resource potential (E5 = 0.086) and sixth industry application V.04 (E3 = 0.050). In detail, the results of the priority effects of economic sub-factors on Indonesian maritime security can be seen in Table 5.

Defense and Security Factors (P = 0.371), if the national defense and security conditions are good, the Indonesian sea security conditions will generally be good. The order of supporting factors that affect Defense and Security, namely: first is *Badan Keamanan Laut* (Bakamla) strength (P4 = 0.440), second is the defense equipment condition (P2 = 0.269), third is the level of violations in the Indonesian sea (P1 = 0.133), fourth is an increase in military power (P3 = 0.098), and conflicts in Asian waters (P5 = 0.061). In detail, the results of the priority influence of sub-factors can be seen in Table 6.

Table 4. Results of Priority Values of Sub-Factor Comparison Matrices for Politics and Law

	K1	K2	K3	K4	K5	Priority Value	λmax	CI	CR
K1	1,000	3,000	0,200	0,333	5,000	0,200			
K2	0,333	1,000	0,333	2,000	3,000	0,165			
K3	5,000	3,000	1,000	3,000	3,000	0,440	5,399	0,100	0,089
K4	0,500	0,500	0,333	1,000	3,000	0,127			
K5	0,200	0,333	0,333	0,333	1,000	0,068			

Source: Processed by Authors, 2019

Table 5. Results of Priority Values Of Sub-Factor Comparison Matrices for Economics

	E1	E2	E3	E4	E5	E6	Priority Value	λmax	CI	CR
E1	1,000	1,000	3,000	0,333	3,000	3,000	0,190			
E2	1,000	1,000	3,000	0,333	3,000	3,000	0,190			
E3	0,333	0,333	1,000	0,200	0,333	0,333	0,050	6,468	0,094	0,076
E4	3,000	3,000	5,000	1,000	3,000	3,000	0,363			
E5	0,333	0,333	3,000	0,333	1,000	0,333	0,086			
E6	0,333	0,333	3,000	0,333	3,000	1,000	0,121			

Source: Processed by Authors, 2019

Table 6. Results of Priority Values of Sub-factor Comparison Matrices for Defense and Security

	P1	P2	P3	P4	P5	Priority Value	λmax	CI	CR
P1	1,000	0,200	3,000	0,143	3,000	0,133			
P2	5,000	1,000	3,000	0,333	3,000	0,269			
P3	0,333	0,333	1,000	0,200	3,000	0,098	5,422	0,105	0,094
P4	3,000	3,000	5,000	1,000	5,000	0,440			
P5	0,333	0,333	0,333	0,200	1,000	0,061			

Source: Processed by Authors, 2019

Table 7. Results of Priority Values of Sub-Factor Comparison Matrices for Social and Culture

	S1	S2	S3	S4	S5	Priority Value	λmax	CI	CR
S1	1,000	0,333	2,000	0,200	0,200	0,090			
S2	3,000	1,000	1,000	0,333	0,333	0,136			
S3	0,500	1,000	1,000	0,333	0,333	0,096	5,370	0,093	0,083
S4	3,000	3,000	3,000	1,000	3,000	0,394			
S5	5,000	3,000	3,000	0,333	1,000	0,283			

Source: Processed by Authors, 2019

Table 8. Results of Priority Values of Sub-Factor Comparison Matrices for the Environment

	L1	L2	L3	L4	Priority Value	λmax	CI	CR
L1	1,000	2,000	3,000	3,000	0,429			
L2	0,500	1,000	3,000	3,000	0,303	4,220	0,073	0,081
L3	0,333	0,333	1,000	3,000	0,170			
L4	0,333	0,333	0,333	1,000	0,098			

Source: Processed by Authors, 2019

Table 9. Results of Priority Values of Sub-Factor Comparison Matrices for Technology

	T1	T2	T3	T4	Priority Value	λmax	CI	CR
T1	1,000	0,200	0,143	0,333	0,058	4,141	0,047	0,052

T2	5,000	1,000	0,333	3,000	0,282
T3	7,000	3,000	1,000	3,000	0,515
T4	3,000	0,333	0,333	1,000	0,145

Source: Processed by Authors, 2019

Social and cultural factors (S = 0.073), social and cultural conditions in Indonesia are very influential on Indonesia's marine security. The order of supporting factors that influence social and culture, namely: first vertical and horizontal conflict (S4 = 0.394), second level of awareness of sea security (S5 = 0.283), third-degree of social welfare (S2 = 0.136), fourth level of education (S3 = 0.096) and the fifth potential area vulnerability (S1 = 0.090). In detail, the results of the priority effects of social and cultural sub-factors can be seen in Table 7.

Environmental Factors (L = 0.044), environmental conditions in Indonesia are very influential in Indonesia's marine security. The sequence of supporting factors that influence the environmental conditions, namely: first is the geographical conditions in the border region (L1 = 0.429), second is the geographical condition of the waters (L2 = 0.303), third is the geographical condition of the fishing ground area (L3 = 0.170), and fourth is the geographical condition of the disaster area (L4 = 0.098). In detail, the priority of environmental sub-factors can be seen in Table 8.

Technology Factor (T = 0.114), the use and development of technology in Indonesia is very influential in Indonesia's marine security. The sequence of supporting factors that influence technology, namely: first is ownership of maritime technology (T3=0.515), second is the development of maritime information technology (T2=0.282), third is defense equipment and radar technology (T4=0.145), and maritime hardware (T1= 0.145) 0.058). In detail, the results of the priority sub-factor technology can be seen in Table 9.

The sub-factors most influential on Indonesia's maritime security globally are as follows: first is the national political and system sub-factor (0.44), second is the Indonesian economic growth sub-factor (0.35), third is the sub-factor strength of the Indonesia Maritime Security Board (0.44), the fourth is the vertical and horizontal conflict sub-factors (0.39), the fifth is the geographical condition sub-border region (0.43), and the sixth is the maritime information technology ownership sub-factor (0.52).

The next stage is to carry out the process of analyzing the value of sub-factors with the main factors, of the twenty-nine sub-factors will be multiplied by each of the main factors as shown in Table 10. The priority value of the sub-factor after multiplied by the main factor its value changes as follows: first is the national system and politics (0.11), second is Indonesia's economic growth (0.06), third is the strength of the Indonesia Maritime Security Board (0.16), fourth is vertical and horizontal conflict (0.03), fifth is the geographical condition of the border region (0.02), and sixth is ownership of maritime information technology (0.03).

The results of the analysis of the level of influence on each of Indonesia's maritime security factors indicate that decision-makers argue that the factors that most influences on Indonesia's maritime security conditions are: first is the factor of defense and security conditions (0.37) and second is the political and legal factors that occur in Indonesia (0.24). Both of these factors have a very high strategic value to the influence of Indonesia Maritime Security Board, so the Government must maintain the stability of defense and security as well as political and legal conditions in Indonesia, so that

Table 10. Final Results of the Weight Values of Indonesian Maritime Security Factors and Sub-Factors

Goal	Factor	Factor Weight	Sub-Factor	Sub-Factor Weights	Global Weight
The most influential factor for Indonesian maritime security	Politics and Law (K)	0,24	Regional autonomy (K1)	0,20	0,05
			Complexity of maritime institutions (K2)	0,17	0,04
			National system and politics (K3)	0,44	0,11
			Foreign policy (K4)	0,13	0,03
			Territorial zone division (K5)	0,07	0,02
				1,000	**0,24**
	Economics (E)	0,16	Defense and security budget (E1)	0,23	0,04
			Asia region economic growth (E2)	0,17	0,03
			Industrial application V.04 (E3)	0,05	0,01
			Indonesian economic growth (E4)	0,35	0,06
			Potential of natural resources (E5)	0,08	0,01
			The economic growth of the ASEAN region (E6)	0,12	0,02
				1,00	**0,16**
	Defense and Security (P)	0,37	Level of violations in the Indonesian sea (P1)	0,13	0,05
			Alutsista condition (P2)	0,27	0,10
			Increased military strength (P3)	0,10	0,04
			Strength of IMSB (P4)	0,44	0,16
			Conflict in Asian waters (P5)	0,06	0,02
				1,00	**0,37**
	Social and Cultural (S)	0,07	Regional vulnerability potential (S1)	0,09	0,01
			Degree of social welfare (S2)	0,14	0,01
			Level of public education (S3)	0,10	0,01
			Vertical and horizontal conflict (S4)	0,39	0,03
			Level of awareness of maritime security (S5)	0,28	0,02
				1,00	**0,07**
	Environment (L)	0,04	Geographical conditions of the border area (L1)	0,43	0,02
			Geographical conditions of waters (L2)	0,30	0,01
			Geographical condition of the fishing ground (L3)	0,17	0,01
			Geographical conditions of the disaster area (L4)	0,10	0,00
				1,00	**0,04**
	Technology (T)	0,11	Maritime hardware (T1)	0,06	0,01
			Development of maritime technology (T2)	0,28	0,03
			Ownership of maritime information technology (T3)	0,52	0,06
			Alutsista technology and radar (T4)	0,15	0,02
				1,00	**0,11**

Source: Processed by Authors, 2019

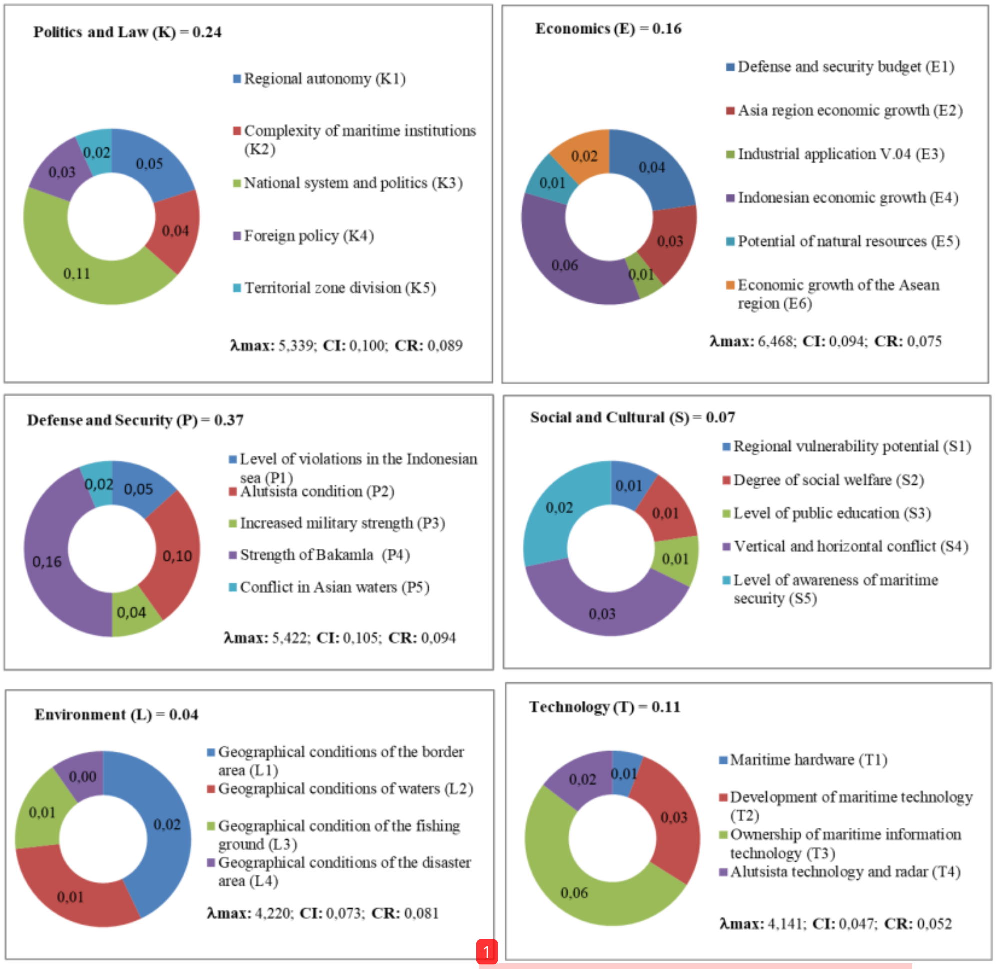

Figure 2. Priority Values of Several Aspects that Affect Indonesia's Maritime Security
Source: Processed by Researchers, 2019

maritime security improvement will also be stable.

While the results of the analysis of the level of influence on each of the Indonesian maritime security sub-factors indicate that the most influential on Indonesia's maritime security conditions are: first is the strategic role of the Indonesia Maritime Security Board (0.16), second is the political and legal conditions in Indonesia (0.11), third is economic growth in Indonesia (0.06), and fourth is ownership of maritime information technology (0.06). In detail, the results of the ranking of each factor and sub-factor can be seen in Table 10.

Based on the results of the analysis of the factors that most influence on Indonesian maritime security, this research concludes that to improve Indonesian maritime security, the Government must set priorities.

The first is to create a conducive national system and politics so that political and legal conditions in Indonesia run well so that maritime security improvement will be created as well. Second is to create Indonesia's economic growth of ± 6% (based on gross domestic product and all macroeconomic indicators) so that the Indonesian economy is getting better, jobs are getting easier, the country's foreign exchange is getting better so the Government will allocate more budget for Indonesia's maritime security. The third is to increase the role and function of the Indonesian Sea Security Agency to become the coordinator of the supervision and security of the Indonesian seas.

The fourth is minimizing vertical and horizontal conflict in the community so that the creation of a peaceful and prosperous society if the conditions of the community are peaceful, national security will be stable. The fifth is to improve security in border areas because geographically Indonesia has 10 sea borders and 3 land borders. Sixth is increasing maritime defense equipment ownership to monitor maritime security in an integrated way.

Figure 2 shows that for political and legal factors, the most influential sub-factor is Indonesia's own legal and political conditions with a percentage value of ± 44%. For economic factors, the most influential sub-factor is Indonesia's economic growth with a percentage value of ± 35%. For defense and security factors, the most influential sub-factor is the role and function of the Indonesia Maritime Security Board to regulate the management of Indonesian marine security with a percentage value of ± 44%. For social and cultural factors, the most influential sub-factor on Indonesian maritime security is the condition of vertical and horizontal conflict in the community with a percentage value of ± 39%. For environmental factors, the most influential sub-factor on Indonesian maritime security is the geographical condition of Indonesia's border areas with a percentage value of ± 43%. For technology factors, the most influential sub-factor on Indonesian maritime security is maritime information technology ownership with a percentage value of ± 52%.

CONCLUSIONS

This study shows that the main factors that have the most influence on maritime security in Indonesia, first are defense and security factors (0.371), second is political and legal factors (0.239), third is economic factors (0.159), fourth are technological factors (0.114), fifth is social and cultural factors (0.073), and sixth is environmental factors (0.044). One of the more significant findings that emerged from this study is that the six sub-factors that most influence the maritime security of Indonesia, namely: first the national political and system sub-factors (0.11), second are the sub-factors of Indonesia's economic growth (0.06), the third is the strength sub-factor of the Indonesian sea Security Agency (0.16), the fourth is the vertical and horizontal conflict sub-factor (0.03), the fifth is the geographical condition sub-factor of the border region (0.02), and the sixth is the maritime information technology ownership sub-factor (0.06). The findings of factors and sub-factors that affect the condition of Indonesia's maritime security require serious attention from the Government to improve Indonesia's maritime security.

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