

PAPER NAME

Green Supply Chain Productivity Modelin g for Oyster Mushrooms Agroindustry Im provement.pdf

AUTHOR

Ma'ruf Pambudi Nurwantara

WORD COUNT 3916 Words	CHARACTER COUNT 21842 Characters
PAGE COUNT 7 Pages	FILE SIZE 951.3KB
SUBMISSION DATE Aug 10, 2022 7:41 PM GMT+7	REPORT DATE Aug 10, 2022 7:42 PM GMT+7

5% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

- 0% Internet database
- Crossref database
- 2% Submitted Works database

Excluded from Similarity Report

- Bibliographic material
- Manually excluded text blocks

- 4% Publications database
- Crossref Posted Content database
- Cited material



Green Supply Chain Productivity Modeling for Oyster Mushrooms Agroindustry Improvement

Ma'ruf Pambudi Nurwantara¹, Luluk Sulistiyo Budi², Nunik Hariyani³, Dian Ardifah Iswari⁴

^{1,2}Department of Agrotechnology, Faculty of Agricultural, Merdeka Madiun University, Jalan Serayu, Madiun, East Java, 63133, Indonesia

³Department of Communication Studies, Faculty of Social and Polotical Sciences, Merdeka Madiun University, Jalan Serayu, Madiun, East Java, 63133, Indonesia

⁴Department of Bio-Entrepreneurship, Faculty of Formal and Applied Sciences, Muhammadiyah University of Madiun, Jalan Mayjend Panjaitan, Madiun, East Java, 63137, Indonesia

ABSTRACT: Oyster mushrooms agroindustry in Indonesia have been potential in an effort to support local economic development. The objectives in this paper are to analysis the requirement of system design green productivity oyster mushrooms supply chain, to select the important attributes and to determine development strategies for increased green productivity. In order to analyze the requirement system, use case diagram and Business Process Model and Notation (BPMN) were used in this paper. Relief method was used to select the important parameter attributes which sufficiently describe environment variables affecting the upstream and downstream supply chain of oyster mushroom. Then, to establish the rule in the formation of strategy formulation, Association Rules Mining was applied. The results are analysis in this paper system with BPMN business flow diagram can describe the system more easily. Relief method shows that the most important economic variable is sawdust. Association Rules Mining shows that economic variables with high corn and high ring was produced low sawdust with 100% confidence level and support value of 0.167 This research is expected to facilitate prediction of strategy to increase productivity oyster mushroom agroindustry based on existing environment condition.

KEYWORDS: Association Rules Mining, Green Productivity, Oyster Mushrooms, Relief, Supply Chain

INTRODUCTION

The development of the oyster mushroom industry is currently growing rapidly along with the changing paradigm of people in consuming fruits and vegetables. Consumer demand in vegetable consumption can only be met by oyster mushroom farmers by 2015 amounting to 3% of total demand for vegetables in Indonesia (Direktorat Jenderal Bina Produksi Hortikultura 2015). In this case the company is required to continue to improve performance in order to compete with various other agroindustries. Along with the increase of production, have many environmental problems. The problem is caused by the production process often result in the disposal of materials and Emision that will burden the environment, whereas good production processes not only attention to the safety and side effects of waste waste process, but also reduce waste generated. This problem is also often ignored by the oyster mushroom agroindustry, whereas now the environmental issues become quite warmly discussed. Therefore, it is very important for oyster mushroom agroindustry attention to environmental aspects in each production process implemented in order to create suitability with the surrounding environment, and also organic agriculture should sustain and enhance the health of soil, plant,

animal, human and planet as one and be indivisible. It should be based on living ecological systems and cycles, work with them, emulate them and help sustain them (Adiprasetyo *et al.* 2015).

To improve productivity while reducing environmental impacts, the Green Productivity method can be an approach to help companies deal with existing problems. Thus, the application of this method is expected to increase productivity by minimizing waste and reduce the impact on the environment. Green productivity (GP) is a strategy to increase company productivity and environmental performance simultaneously in overall socioeconomic development (Asian Productivity Organization 2001). Green productivity is an application of the right techniques, technology and management system to produce environmentally friendly products or services. GP reconciles two needs that are always in conflict, namely the business needs to generate profit and the needs of everyone to protect the environment. GP is not just an environmental strategy, but a total business strategy. In fact, that when GP is implemented, companies will

In fact, that when GP is implemented, companies will experience productivity improvements through reduced spending on environmental protection, such as resource depletion, waste minimization, pollution reduction and better production. From here, the company can achieve higher productivity and protect the environment that will lead to sustainable development. This includes the use of products and services that can meet basic human needs and improve quality of life. The entire life cycle of this product should be based on the minimization of the use of natural resources and toxic substances that can lead to emissions.

The definition of Productivity itself is the ratio (ratio) between output per input (Wignjosoebroto & Sritomo 2015). ith the knowing of productivity, it will also be known how efficiently the input sources have been successfully saved. Over the last few decades, productivity is a fairly popular term, and according to the fact that productivity has become a national economic priority. In a micro level, increased productivity means enhancing the company's competition and better quality of life. Then an indicator can be defined as a parameter or a measurable amount based on the amount examined or calculated. An environmental indicator is one thing that is expected to reflect on the impacts of an activity on the environment and efforts to reduce it. For the selection of solutions from existing alternatives, the relief method is used. Relief algorithms are an effective, simple, and widely used approach to measuring feature weights. The weights for the measurement vector feature are defined in terms of feature relevance. In probabilistic interpretation the relief is made to state that the weight indicates in a propositional feature with the difference between two conditional probabilities. Both of these probabilities are the value of different features conditioned on the nearest nearest kesalahn and the closest takings. Thus, the relief typically performs better than any other filter-based approach due to feedback from the nearest alternative classifier.

Productivity is enhanced by the selection of appropriate strategies to run optimally within the company. In the preparation of strategy will be used method of Associate Rule Mining ARM method. Association rule mining is one method of data mining that can identify relationships between items (Han et al. 2012). In this method it takes an algorithm to find candidates for association rules. One common algorithm used is an a priori algorithm. The merit of association rules with this a prior is simpler and can handle large data. While other algorithms have a weakness in the use of memory when the amount of large data, of course, affect the number of items processed. The importance of the rules of association can be identified by two parameters, minimum support (percentage of item combinations in the database) and minimum confidence (both strong relations between items in associative rules), both determined by the user (Will 2009). The use of a priori is aimed to find association rule in simulation of increasing productivity of oyster mushroom agroindustry with green productivity approach.

In this study, will conduct research by creating a system that applies the method of association rule mining as a strategy simulation tool. Variables contained in the data is the result of the selection with the method of relief which is then prepared with the approach of green productivity. The approach taken is to look for similarities between items on each transaction. Then formed associative rules based on these similarities. Associative rules serve as a reference in weather precision in this study.

MATERIAL AND METHOD

A. Thinking Framework

System analysis to know the description of the repair process productivity supply chain. This system analysis is simulated by modeling design and system consisting of requirement analysis, use case diagram, and BPMN. Design and system design using sybase PowerDesigner® v16.0 tools to perform system analysis. The steps in making the system can be seen in figure 1.



Figure 1. Stages of system formation

B. Needs Analysis

Needs analysis by determining inputs (Acceptable and Unacceptable), stakeholders, and controls needed to achieve system goals. Steps in needs analysis include identifying and

making system requirements, prioritizing system requirements, updating project plans and communicating system requirements.

C. Use Case Diagram

Use case diagram is a graphical representation in which a set of use cases is covered by system boundaries, communication (participation) relationship between actors based on system to be improved.

D. Process Hierarchy Diagram (PHD)

PHD is a graph that analyzes business functions as a process hierarchy to help decipher subprocesses in the system.

E. Business Process Model Notation (BPMN)

BPMN is a graphical notation that can represent a stream of business processes. BPMN is used as a modeling process in a system. In BPMN requires having successive business process activities.

F. Input Details

In this paper that will be done to improve the system that is by conducting analysis and design system improvement of environmental productivity supply chain oyster mushroom agroindustry. In analyzing and designing this system, seven variable sources of waste generation (waste) are used in the production activities in an activity of added value that is Emision consumption, water consumption, waste material, waste, transportation, emission and biodiversity (Kira *et al.* 1992).

The definition of the system in this paper is a unity of elements that are integrated through input in the form of supply chain productivity elements with green productivity approach based on environmental indicators elements in the form of seven sources of waste generators operated by using Relief and Association Rules Mining method to produce output in the formulation of strategies to increase productivity chains Supply of oyster mushrooms that are synergistically conducted by stakeholders involved in the researcher, farmer, oyster mushroom agroindustry and government. To produce the system required analysis entisas forming system. The entity-forming system diagram can be seen as figure 2:



Figure 2. Need Analysis System & Design

G. Formulation Process Relief

Identification of the most influential environmental variables on increasing productivity of the supply chain of oyster mushroom agro industry starting from the formulation of the concept of the problem and the identification of seven sources of waste generation from upstream and downstream sectors.

In this paper the data used are dummy data from seven variable sources of waste generating materials, waste, transportation, biodiversity, water, emission and Emision. An analysis of seven sources of waste generation is conducted to identify the flow of green materials. Through this identification, it is found that the source data material that influences as a source of waste generators, which then used as a basis in the formulation of strategies to increase supply chain environmental productivity. Preprocessing data by using relief consists of the stages of data normalization, the calculation of the weight value of each variable and ranking. Normalization of data is the process of normalizing the data so that the distance between attributes is not much different. Normalization of data is done by using the following formula:

$$x_i' = \frac{Xi - \min i (Xi)}{\max_i (Xi) - \min_i (Xi)}$$

Relief is one of the feature selection methods. The relief algorithm works by random sampling by finding the location of the nearest feature of the same class (hit) and opposite (miss). The relief algorithm is generally as follows (Niu & Chen 2013):

Relief
$$(\delta, m, \tau)$$

Separate δ^- (negative instance) dan δ^+ (positive instance) $W = (0, 0, \dots, 0)$

Pict at random an instance $X \in$ Pict at random one of positive instances Closest to $X, Z \in \delta^+$ Pict at random one of positive instances

Closest to X, $Z^+ \in \delta^-$

If (X is intance positif)

Then Near-hit = Z^+ , Near-miss = Z^-

"Green Supply Chain Productivity Modeling for Oyster Mushrooms Agroindustry Improvement"

Else Near-hit = Z⁻, Near-miss = Z⁺ Update-weight (W,X,Near-hit, Near-miss) Relevance= (1/m)W For i=1 to p

If (*relevance* $\in \tau$)

Then f_i is a relevant feature Else f_i is a irrelevant feature Update-weight (W, X, Near-hit, Near-miss) For i = 1 to p Wi= Wi – diffi (Xi, near-hit_i)+ diffi (Xi, near-miss_i)

Association Rule Mining

Data mining is a generic term which cover research results, techniques and tools used to extract useful information from large database (Agrawal & Srikand 1994). Association rules is one the mot populer data mining techniques widedly used for discovering interestring association and corelations as between data elements in a diverse range of application (Kusrini & Emha 2009). Associated analysis is also known as one of the data mining techniques that became the basis of one of the other data mining techniques. In particular, one of the stages of association analysis that attracted the attention of many researchers to produce an efficient algorithm, namely the analysis of frequent pattern mining (Han *et al.* 2006).

In general, the association rule has the form: LHS \Rightarrow RHS where LHS and RHS are set items; If any items in the LHS are contained in the transaction then the items in the RHS are also contained in the transaction. Association rules are usually expressed in forms (Tan *et al.* 2006):

 $\{A, B\} \Longrightarrow \{C\} (support = 10\%, confidence = 50\%)$

This method uses data from the three ranking variables in the relief method. The stages to form rules by using association rules are:

1. Calculate the bond value

Obtained conjunctive and disjuctive value to then get bond value

Bond
$$(AB) = \frac{P(A \land B)}{\Sigma AVB} \times 100\%$$

 $\Sigma A \land B = Conjunctive$
 $\Sigma A \lor B = Disjunctive$

2. Calculate the support value

Support (AB) =
$$\frac{P(A \land B)}{\Sigma n} \times 100\%$$

3. Calculate the confidence value

Confidence
$$(A \rightarrow B) = \frac{P(A \land B)}{Conjunctive(A)} \times 100\%$$

4. Calculate the lift value

9

$$Lift(A,B) = \frac{Support(A,B)}{Support(A) \times Support(B)}$$

5. Calculate the conviction value

 $Conviction (A \rightarrow B)$ = $\frac{1 - \sup P(B)}{1 - \operatorname{conf}(A \rightarrow B)}$ = $\frac{P(A)P(\sim B)}{P(A \cap \sim B)}$ =((Support(A)×Support(~B))/Support(A→~B))×100%

- 6. Calcculate the leverage value Leverage (A→B) = P(A ∩ B) - (P(A)P(B))
 - = (Support ($A \rightarrow B$) (Support(A) × Support(B))) ×100%
- 7. Determines Top-10 association rules= Value supp x Value conf
- 8. Formulate association rules into mathematical models $R_n = \{A_1^n\} \rightarrow \{Y^n\}$

In this paper the algorithm used to form association rules is by using a priori algorithm. Priori algorithm is an algorithm used for mining frequent itemset using boolean association rules (Niu & Chen 2013). Here is the a priori algorithm (Agrawal & Srikand 1994):

$$k = 1$$

$$F_k = \{i \mid i \in I \land \sigma (\{i\}) N \times minsup\}.$$

{*Find all frequent* 1 – *itemsets*}

repeat

k = k + 1

 $C_k = apriori - gen(F_{K-1}).$

{ Generate candidate itemsets}

for each transaction $t \in T$ do

 $C_t = subset(C_k, t).$

{Identify all candidates that belong to t}

for each candidate itemset $c \in C_t$

 $do \sigma (c) = \sigma (c) + 1.\{ Increment support count \}$ end for

end for $F_{k} = \{c \mid c \in C_{k} \land \sigma(c) \ge N \times minsup\}.$ Extract the frequent $k - itemsets\}$ until $F_{k} = \emptyset$

 $Result = \cup F_k$

H. Verification and Validation

Verification is done by checking whether the system design improves the supply chain productivity of oyster mushrooms. Analysis of systems that are created by being implemented correctly or not. Verification is obtained in the software used. Validation can be done using a method approach will be used to demonstrate and ensure the system that meets the operational needs.

RESULTS AND DISCUSSION

A. System Analysis

System analysis consists of needs analysis, use case diagram, PHD and BPMN. The needs analysis of this system consists of inputs, stakeholders, resources, threats, roles, required processes and expected outputs within the system. The use case describes the relationship between stakeholders consisting of researchers, oyster mushroom agroindustry, suppliers and government related to their respective functionalities following use case diagrams in the system of increasing supply chain productivity of onion agroindustry. "Green Supply Chain Productivity Modeling for Oyster Mushrooms Agroindustry Improvement"



Figuere 3. Use case diagram

In systems analysis, modeling function BPMN flow of business activities so that the work flow system easier to understand. BPMN represents analysis and design of productivity improvement system of supply chain of oyster mushroom agro industry. Workflow process based on destination. The first stage is to analyze the problems in the supply chain of oyster mushroom agroindustry. The second stage is to analyze the environmental variables of both econonomic and environment sectors through weighting the value of each variable. The third step is to formulate a strategy to increase productivity of agro-industry supply chain by establishing association rules based on influential variables. BPMN can be seen in Figure 4, 5 and 6 as follows:







Fig 5. BPMN Measure of Performance Variable



Figure 6. Determine Strategy of Association Rule

B. System Design

Relief

Based on the result of weighting relief by using weka on upstream and downstream sector environment variables shown in table 1.

 Table 1. Result of relief environment variabel

Atribute	Hit	Rank
Transportation	0.2092	1
Emision	0.0991	2
Material	0.0783	3

 Table 2. Determine the association rules Top 10

Energy	-0.0181	4
Waste	-0.0192	5
Water	-0.0388	6

There are three variables that occupy the highest weight of transport, emissions and emissions. This variable is a source of waste that affects the productivity level of the oyster mushroom environment. The three variables with the highest weights are then used as variables in the formulation of rules of strategy formulation to improve the productivity of the supply chain environment of oyster mushroom agroindustry. These three variables will be processed by using association rule, resulting in table 2.

IF	Then	Support	Conf	Lift	Convic
Material=Medium, Transportation=	Emision-Uigh	0.167	1 000	1 714	Infinity
Medium	Emision= riign	0.107	1.000	1./14	mmity
Transportation=Medium,	Material=Low	0.167	1.000	3.000	Infinity
Emision=Medium					
Transportation=Medium, Material=Low	Emision=Medium	0.167	1.000	2.400	Infinity
Material=Medium,	Emision=High	0.417	0.833	1.429	2.500
Material=Low	Emision=Medium	0.250	0.750	1.800	2.333
Emision=High, Transportation High	Material=Medium	0.250	0.750	1.500	2.000
Transportation=High,	Emision=Medium	0.250	0.750	1.286	1.667
Material=Medium					
Emision=High, Transportation High	Material=Medium	0.417	0.714	1.429	1.750
Transportation=High	Emision=High	0.333	0.667	1.143	1.250
Transportation=High	Material=Medium	0.333	0.667	1.333	1.500

In association rules, rules are interpreted only by rules that have a lift value> 1. Also in determining the Top-10 rules the association of values used as a material consideration is the value of conviction. The value of conviction is a value that measures the level of implications of a rule. The result of the formulation of the rules is used to formulate a strategy to increase environmental productivity. In table 4 one of the association rules is {Material = Medium, Transportation = Mediun} \rightarrow {Emision = High} with lift value 1,714, Support 0.167, conviction Infinity and 100% confidence (100% probability affects supply chain productivity improvement if material consumption Medium, medium-generated transport then use of Emision High consumption) causes low supply chain productivity and elevator> 1 indicates that the rule can be used. Table 4 shows the relationship between antencendent and consequent.

The final result of the standard operating procedure is the best decision which is taken from various opportunities with the

"Green Supply Chain Productivity Modeling for Oyster Mushrooms Agroindustry Improvement"

help of "rule-based if and then" (Budi 2017). These rules can be formulated as a strategy to increase supply chain productivity. Based on the established rules, the strategies that can be applied are (1) minimize the use of materials, (2) minimize the use of transportation (3) to minimize the emissions produced. The rules can be seen in table 3 as follows.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions in this paper are:

1. The analysis of the system of increasing supply chain productivity of oyster mushroom agroindustry is represented by using BPMN facilitate the writer in formulating strategy formulation.

- 2. Based on the results of the identification of environmental variables obtained by each three variables with the highest value weight. The influential environmental variables are Transport, Emission and Material.
- 3. On the establishment of association rules obtained maisng each sector Top-10 rules. Based on the rule then formed a strategy formulation on each variable that influences.

Suggestions in this study are:

Should in analyzing and designing to obtain valid system results used data in accordance with reality so that can represent the system in real.

	Antecendent				Consequent			
	MaterialTranspoEmisionMediumMedium			Material	Transpo	Emision		
						High		
IF		Medium	Medium				Medium	
	Low	Medium					Medium	
	Medium						High	
	Low						Medium	
		High	High		Medium			
	Medium	High					Medium	
			High		Medium			
		High	High	z	Medium			
		High	High	THE			High	
		High			Medium			

Table 3. Rule Association

REFERENCE

- Adiprasetyo T., Sukisno, Setyowati N, Ginting Sempurna, Handajaningsih M. 2015. The Prospect of Horticultural Organic Farming as Sustainable Agricultural Practice for Reducing Poverty: The Case in Bengkulu City, Indonesia. International Journal on Advance Science Engineering Information Technology 5(6) ISSN: 2088-5334
- Agrawal R, Srikand R. 1994. Fast Algoritms for mining association rules. In Proceedings of the 20th International Conference on Very Large Data Bases; 1994 Sep: San Francisco. 487-499
- 3. Asian Productivity Organization. 2001. Concept Of Green Productivity. Tokyo: APO.
- Budi L. S., 2017. The Application of Fuzzy Logic Control Systems on Harvesting Standard Operating Procedures Models of Sesame Crops in Indonesia. International Journal on Advance Science Engineering Information Technology 7(3) ISSN: 2088-5334
- 5. Direktorat Jenderal Bina Produksi Hortikultura. 2015. Statistik Produksi Hortikultura.

- 6. Han, J. et al. 2012. Data Mining Concept and Technique (3rd Eds). Elsvier Inc.
- 7. Han, J., Kamber, M., & Pei, J. 2006. Data mining : concepts and techniques. Elsevier/Morgan Kaufmann.
- 8. Kira, Kenji and Rendell, Larry.1992. The Feature Selection Problem: Traditional Methods and a New Algorithm. AAAI-92 Proceedings.
- 9. Kusrini, luthfi taufiq Emha, (2009), Algoritma Data Mining. Andi. Yogyakarta.
- Niu H, Chen H. 2013. An improved recomendation algorithm in knowledge network. Journal of Network 8(6): 1336-1342
- 11. Tan, P.et al. 2006. "Introduction to Data Mining". Boston : Pearson Education.
- Wignjosoebroto, Sritomo. 1995. Ergonomi Studi Gerak dan Waktu Teknik Analisis Untuk Peningkatan Produktivitas Kerja. Candimas Metropole. Jakarta.
- 13. Will, B.2009. Green Intentions : Creating a Green Value Stream to Compare and Win. New york (USA) : Productivity Press

turnitin[®]

• 5% Overall Similarity

Top sources found in the following databases:

- 0% Internet database
- Crossref database
- 2% Submitted Works database
- 4% Publications database
- Crossref Posted Content database

TOP SOURCES

The sources with the highest number of matches within the submission. Overlapping sources will not be displayed.

1	A N Habyba, Delfitriani, T Djatna. "An affective design for jenang pack Crossref	2%
2	Chin-Chun Chang. "Generalized iterative RELIEF for supervised distanc Crossref	2%
3	Universitas Pancasila on 2021-09-30 Submitted works	1%
4	Wildan Budiawan Zulfikar, Agung Wahana, Wisnu Uriawan, Nur Lukman Crossref	<1%
5	coursehero.com	<1%
6	The University of Manchester on 2022-05-24 Submitted works	<1%

turnitin[®]

Excluded from Similarity Report

• Bibliographic material

Cited material

Manually excluded text blocks

EXCLUDED TEXT BLOCKS

Engineering and Technology Journal e-ISSN: 2456-3358Volume 07 Issue

zenodo.org

use case diagram and Business Process Model and Notation (BPMN

doaj.org

AsianProductivity Organization

Marimin, Muhammad Arif Darmawan, Machfud, Muhammad Panji Islam Fajar Putra, Bangkit Wiguna. "Valu...

Green productivity

Suhartini Suhartini. "RANCANGAN SISTEM INFORMASI PENGUKURAN GREEN PRODUCTIVITY DAN ENVIRO...

organicagriculture should sustain and enhance the health of soil, plant, animal, hu...

media.neliti.com

attention to environmental aspects in eachproduction process

Universitas Pancasila on 2020-05-16

Association rule mining is one

Muhammad Muhajir, Gusmayyeni Gusmayyeni, Redita Anggita Sari, Tusriana Rahmatika. "Application of rule...

percentage ofitem combinations in the database) and

Universitas Amikom on 2019-02-15

Use Case DiagramUse case diagram is a graphical representation

blog.coepd.com

Business Process Model Notation (BPMN)BPMN is a graphical notation

sam.ensam.eu



W = (0, 0,... 0)For i = 1 to m

Kenji Kira, Larry A. Rendell. "A Practical Approach to Feature Selection", Elsevier BV, 1992

relevance

Zhe Xiao, Xin Chen, Li Zhou, Ziying Zhang. "Staff lines removal based on naive bayesian model", 2022 13th A...

MiningData mining is a generic term which

Universiti Malaysia Pahang on 2012-05-21

association rule has the form: LHS => RHSwhere LHS and RHS

ejournal.raharja.ac.id

analysis is also known as one of thedata mining techniques that

Rinna Rachmatika, Kecitaan Harefa. "Analysis of Determination of Strategy Promotion using Apriori Algorith...

attracted

infor.seaninstitute.org

Support(A)×Support(~B))/Support(A ~B

The Robert Gordon University on 2015-03-29

A \square B) = P(A \square B) - (P(A)P(B)) = (Support (A \square B) (Support(A) × Support(B))

ailab.ijs.si

8. Formulate association rules into mathematical models

Kartika Trianita, Taufik Djatna, Anas Miftah Fauzi. "A System Analysis and Design of Marketing Strategy for I...

to form association rules

Kartika Trianita, Taufik Djatna, Anas Miftah Fauzi. "A System Analysis and Design of Marketing Strategy for I...

Priori algorithm

infor.seaninstitute.org

$A \boxtimes B$ = 1-supp(B)1-conf($A \boxtimes B$)=P(A)P(~B)P($A \boxtimes ~B$

research.sabanciuniv.edu



CONCLUSIONS AND RECOMMENDATIONSThe

link.springer.com

LowMedium

indyweek.com

HighHigh

indyweek.com

final result of the standard operating procedure is the bestdecision which is taken ...

insightsociety.org

reduce the impact on theenvironment

Yuliana Kaneu Teniwut, Marimin Marimin, Nastiti Siswi Indrasti. "Spatial intelligent decision support system ...