# Performance Analysis of Furniture Product Supply Chain Using SWOT Method to Build Strength by Considering Key Factors of ISM Approach

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**Abstract.** The supply of furniture products desired by consumers was not on time, because the delivery of supplies of wood raw materials for the production process was delayed. Management of the supply chain system is not going well. Supply chain system management is based on activities related to the flow and transformation of goods, starting with the flow of materials, then following up to the end user, by connecting the flow of information. The integration of the entire supply chain system provides a sustainable competitive advantage. In maintaining a sustainable furniture supply chain system, self-evaluation is required using the SWOT method. This method is able to build on the potential strengths of furniture SMEs resources, and is able to improve the weaknesses of furniture SMEs. The SWOT method can open up wide business opportunities in serving consumers and understanding the threats that will occur in furniture SMEs. Analysis of the performance of the furniture SME supply chain in a sustainable manner considers economic, social and environmental aspects. Performance evaluation is formulated using an Interpretative Structural Modeling (ISM) approach. The research objective is to determine alternative strengthening strategies for key variables through a structured system model of strengths, weaknesses, opportunities and threats. Based on the four factors, the strength factor is the main indicator of strengthening improvement in the supply chain system in furniture SMEs in a sustainable manner.

**Keywords:** Supply Chain, Furniture, SWOT, ISM

## 1 Introduction

The furniture supply chain system at the Jombang-Indonesia furniture SME center has changed due to the Covid 19 pandemic. The post-Covid 19 pandemic has had an impact on delays in the delivery of furniture products from upstream to


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downstream [1,2]. Delays in supply chain activities are caused by a strategic system built to support supply chain activities that is not properly planned. The supply of teak wood materials from forests is not going well due to a new policy that must be followed from Perhutani [3,5]. Teak wood material that has been sent to UKM furniture is produced into furniture products according to consumer wishes. Demand for furniture products that are in accordance with consumer desires will have an impact on sustainable sales activities [4,6,7]. The furniture product supply chain seeks to integrate all systems involved in meeting consumer needs. The involvement of all parties in supporting the supply chain system will provide mutual benefits. The profits derived from the business results of furniture production activities are able to provide sustainable benefits.

In maintaining a supply chain system for furniture products in a sustainable manner, it is necessary to self-evaluate using the SWOT method which consists of Strengths, Weaknesses, Opportunities and Threats [8,9]. The strategy that will be carried out by furniture SMEs in carrying out business activities in a sustainable manner must meet the strengths possessed by SMEs. The strategy used seeks to reduce the weaknesses of furniture SMEs to get maximum results. Furniture SMEs seek to open business opportunities that are still wide open by using online marketing in the form of digital marketing. The activities of furniture SMEs are not running smoothly because there are still many threats caused by the central environment of furniture SMEs themselves and furniture products from abroad [10,15,17].

Production activities carried out at the Jombang-Indonesia furniture UKM center provide great benefits to the surrounding community, because they are able to absorb labor and increase people's income [11,12]. Problems in furniture SMEs arose due to sales restrictions due to the Covid 19 pandemic and have continued to this day. The habit of selling is done face-to-face, now experiencing changes in online sales. The ability of furniture SMEs to sell online has not been implemented optimally due to limited resources owned by furniture SMEs [8,18]. Problem solving can be done using an Interpretative Structural Modeling (ISM) approach to find out exactly the root of the problems faced by furniture SMEs. The benefits of the ISM method are that it is able to provide a fundamental understanding of complex conditions to be solved in a simple way [5.6]. Business management in a sustainable supply chain can be identified by using the ISM method, because this method is able to carry out quantitative analysis related to the sub-elements in each influential aspect [6,14].

Making the right decisions with a high level of efficiency and effectiveness is needed to support the strategic direction of furniture SMEs. After the end of the Covid 19 pandemic, business activities engaged in the furniture SME sector still provide many sizable opportunities. Furniture SMEs have a strategic role in building the national economy [3,15,17]. The procurement of teak wood raw materials has not met the expectations of furniture SMEs, so replanting is needed in unproductive forests with better forest management.

In developing a sustainable supply chain system strategy for furniture SMEs, an Interpretative Structural Modeling (ISM) approach is needed. Limitations of

movement due to the Covid 19 pandemic gave the idea to carry out a supply chain system strategy analysis in a sustainable manner using the ISM method approach. The ISM analysis is carried out by considering the Economic, Social and Environmental factors called the 3 pillars of a sustainable supply chain [13,18]. The preparation of the ISM analysis is set at 31 sub-elements consisting of 10 sub-elements of the economic element, 10 of the social elements, and 11 of the environmental elements. Based on the ISM analysis, from 31 sub-elements, we will look for sub-elements that are very influential in increasing furniture business activities.

The research aims to strengthen the strategic management model with the integration of conducting studies on elements of economic, social and environmental aspects by using the Interpretative Structural Modeling (ISM) analysis tool. The study was conducted to determine the strategy by evaluating the interaction strategy with the capabilities of the available resources based on the ISM approach.

## 2 Research Method

### 2.1 Interpretative Structural Modeling (ISM)

The structural mapping step of interconnections between attributes that involves qualitative and interpretive to transform in the form of a multi-level structural model on complex problems is the ISM method. This method approach is able to decompose a complex system into sub-systems so as to form a multi-level structural model [17]. The ISM method will provide a description of the most influential sub-elements of each element. The results of the analysis of dependencies and drive power will be connected to find out the position of the sub elements [14].

The ISM method is able to provide a clear description of the elements of the problem that has been determined, so that it can move the description into more detailed sub-elements. The management strategy classification is divided into 4 quadrants, namely:

1. Quadrant I: Autonomous, weak relationship between Drive Power (DP) and Dependence (D), does not have a strong system relationship between sub elements in the position of Drive Power (DP) value < 0.5*X and Dependent (D) value < 0.5*X, with X = the number of sub elements in one Element.
2. Quadrant II: Dependent, the relationship is weak on Drive Power (DP) and strong on Dependence (D), in this quadrant the sub elements are not independent because they influence each other with the position of the Drive Power (DP) value <0.5*X and the Dependent value ( D) > 0.5*X.
3. Quadrant III: Linkage, a strong relationship between Drive Power (DP) and Dependence (D), in this quadrant the sub elements are unstable, the position value of Drive Power (DP) > 0.5*X and Dependent value (D) > 0.5 *X.
4. Quadrant IV: independent, a strong relationship between Drive Power (DP) and a weak Dependence (D), this quadrant enters the remaining part of the system

and the independent variable, at the position of the Drive Power (DP) value > 0.5*X and the value Dependent (D) < 0.5*X.

## 2.2 Furniture Supply Chain Structural Model

Each system element will be described clearly in the form of sub-elements aimed at understanding the behavior of the system as a whole so as to form a structural model [17]. Each sub element has a relationship in one element, then analyzed using the ISM method. The results of opinions from experts who are competent in the field of furniture are used as a basis for conducting analysis. Data analysis also uses literature review that comes from previous research. The main aspects used as data analysis use economic, social and environmental aspects.

In carrying out the linkage analysis of each sub-element, it is carried out using the ISM-VAXO technique. Based on the results of the answers from the experts, the data generated form the SSIM Matrix. The results of the SSIM Matrix data are then transformed into a Reachability matrix in the form of binary numbers. The transitive test obtained from the Reachability Matrix (RM) in the final form is the ultimate goal of the relationship between sub-elements. The next step of the key sub-elements of the system is based on the largest value of the driver power (DP) as the total relationship of the sub-elements with the highest level (L) position which is seen in the dependent level position (D) at the lowest part.

## 2.3 Research Stages

1. Identification of indicators for strengthening sustainable supply chains.

Economic, social and environmental aspects are used as considerations in determining the strengthening of a sustainable supply chain system. In influencing the identification of Furniture SMEs are the diversity of SMEs, regional characteristics, optimizing the role of SMEs and the relationship between SMEs behavior. All elements of strengthening a sustainable supply chain can be described in the form of a sub-element system.

2. Data Analysis and Deployment

Data analysis was carried out to determine the need for designing or engineering a supply chain system implemented in Jombang-Indonesia furniture SMEs. Application using the ISM method according to self-evaluation studies using the strengths, weaknesses, opportunities, threats (SWOT) method. Elements of the economic aspect of strengthening the furniture supply chain are internal data according to the strength factor (S) and opportunity factor (O) which consists of 10 sub-elements, 10 social aspects and 11 sub-elements to environmental aspects. Respondents who filled in data for analysis materials were determined to be 5 competent experts in the field of furniture. The selection of respondents must be able to represent the population of furniture SMEs.

3. Evaluation of a Sustainable Supply Chain System

Evaluation is used to determine the ability of the model that has been made to represent real conditions. The evaluation stage is an important stage in determining the right strategy in making a study on the interaction of the capabilities of the resources owned according to the strategy in making various alternative strengthening scenarios. Based on the evaluation and modeling results, it can be seen that the key sub-elements of the economic, social and environmental aspects are identified.

# 3 Results and Discussion

## 3.1 ISM Simulation and Analysis

The method used in this research is Interpretative Structural Modeling, while the respondent's data aggregation technique uses the initial reachability matrix (RM) data mode for each respondent. The form of the ISM-VAXO technique shows the relationship between sub-elements on the economic aspect. Data entry is based on the opinions of experts in their fields which are formed into a Structural Self Interaction Matrix (SSIM). Furthermore, it is transformed in the form of binary numbers into the Reachability Matrix (RM) matrix form, after which the transitivity test is carried out.

## 3.2 Simulation of Elements of Economic Aspects

Based on the elements of the economic aspect using the SWOT analysis, sub-elements of the economic aspect are made, consisting of 10 sub-elements as follows:

E1. Profitability of the furniture supply chain.
E2. Increasing the Welfare of employees and SMEs.
E3. Development of the Office of Cooperatives in the field of furniture SMEs.
E4. Creating jobs for the community.
E5. Financial Institution Support for venture capital.
E6. Industry & Trade Office Support.
E7. Increasing standardization of product quality and quantity.
E8. Product price warranty discrepancies.
E9. Production capacity that is able to meet consumer needs.
E10. The supply of wood has an impact on production activities.

1. Determine the comparison of each sub-element of the economic aspect.

In this study to determine the comparison of each element using a comparison between the sub-elements of the economic aspect from expert opinion in the form of the ISM-VAXO matrix contained in table 1.

**Table 1.** Reachability Matrix Elements of Economic Aspects

| SYMBOL PROGRAMS | e1 | e2 | e3 | e4 | e5 | e6 | e7 | e8 | e9 | e10 |
|---|---|---|---|---|---|---|---|---|---|---|
| e1 | | V | X | X | O | O | A | X | V | V |
| e2 | | | V | X | X | V | O | V | V | V |
| e3 | | | | X | A | V | V | X | X | O |
| e4 | | | | | A | X | V | V | O | X |
| e5 | | | | | | O | X | V | V | V |
| e6 | | | | | | | X | V | A | A |
| e7 | | | | | | | | O | V | V |
| e8 | | | | | | | | | V | V |
| e9 | | | | | | | | | | A |
| e10 | | | | | | | | | | |

2. The stage of changing the Reachability Matrix (RM) into a binary sub-element of the economy.

This stage changes data from respondents who are experienced and have skills in their fields, then entered in the SSIM matrix and transformed in the form of binary numbers into an RM matrix as shown in table 1. Reachability Matrix. Data processing converts data from the letters V, A, X and O to binary numbers (0 and 1). The RM matrix is prepared based on the calculation of the number data that often appears (mode) from the respondent's answers. Determination of values is based on filling in questionnaires from experts with numbers that appear frequently, as shown in table 2.

**Table 2.** Reachability Matrix of Binary Numbers Elements of Economic Aspects

| SYMBOL PROGRAMS | e1 | e2 | e3 | e4 | e5 | e6 | e7 | e8 | e9 | e10 |
|---|---|---|---|---|---|---|---|---|---|---|
| e1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| e2 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| e3 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| e4 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| e5 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| e6 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 |
| e7 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| e8 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| e9 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| e10 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |

3. Adjustment of the Reachability Matrix of Economic Aspect Elements

The results of adjusting the Rank value (R), the Driver Power value (DP), the Level value (L), and the Dependent value (D). The final DP result is achieved by adding the binary digits in one line. The R value is obtained by sorting the DP values. The value of D is obtained by adding up the binary numbers in one column. The value of L is obtained by sorting the value of D. The table results from the process of

adjusting binary numbers from expert opinion in the reachability matrix of the relationship between sub-elements of the economic aspect can be seen in table 3.

**Table 3.** Reachability Matrix of Adjustment of Economic Aspect Elements

| SYMBOL PROGRAMS | INTERVENTION OF SUPPORTING SUB-ELEMENTS SUPPLY CHAIN SYSTEM | | | | | | | | | | DP | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | e1 | e2 | e3 | e4 | e5 | e6 | e7 | e8 | e9 | e10 | | |
| e1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 7 | 3 |
| e2 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 7 | 2 |
| e3 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 6 | 4 |
| e4 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 8 | 3 |
| e5 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 8 | 1 |
| e6 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 6 | 1 |
| e7 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 6 | 3 |
| e8 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 5 | 4 |
| e9 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 6 |
| e10 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 5 |
| D | 5 | 5 | 8 | 7 | 3 | 3 | 5 | 7 | 8 | 7 | | |
| L | 4 | 5 | 3 | 4 | 6 | 6 | 4 | 3 | 1 | 2 | | |

4. Final Reachability Matrix, sub-element of Economic Aspect

The final result of the Reachability Matrix (RM) is used to test the transitive properties of each cell until a final RM is produced according to the ranking order of the sub-elements of the economic aspect in table 4. The DP value ranking based on the R value is E5. The results at the D Value Level are based on the L value, namely E9. The results of the ranking with the highest DP value are Financial Institution Support for business capital (E5), Industry & Trade Office Support. (E6). The E5 and E6 sub-elements are the key sub-elements contained in the economic aspect, while the highest level in the D value is production capacity that is able to meet consumer needs (E9).

**Table 4.** Final Reachability Matrix Elements of Economic Aspects

| SYMBOL PROGRAMS | INTERVENTION OF SUPPORTING SUB-ELEMENTS SUPPLY CHAIN SYSTEM | | | | | | | | | | DP | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | e1 | e2 | e3 | e4 | e5 | e6 | e7 | e8 | e9 | e10 | | |
| e1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 6 | 3 |
| e2 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 7 | 2 |
| e3 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 5 | 4 |
| e4 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 6 | 3 |
| e5 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 8 | 1 |
| e6 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 8 | 1 |
| e7 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 6 | 3 |
| e8 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 5 | 4 |
| e9 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 6 |
| e10 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 5 |
| D | 5 | 4 | 7 | 5 | 3 | 3 | 5 | 7 | 9 | 8 | | |
| L | 4 | 5 | 3 | 4 | 6 | 6 | 4 | 3 | 1 | 2 | | |

5. Determine the Hierarchical structure model of the sub-elements of the economic aspect

The results of the ISM-VAXO model show, the structure of the positional arrangement of the relationship between sub-elements in the economic aspect element consists of 6 levels as shown in Figure 1. Based on the assumption that the relationship between the sub-elements of the economic aspect shows a relationship that supports and influences each other on the sub-elements economic aspects that are at the lower level.

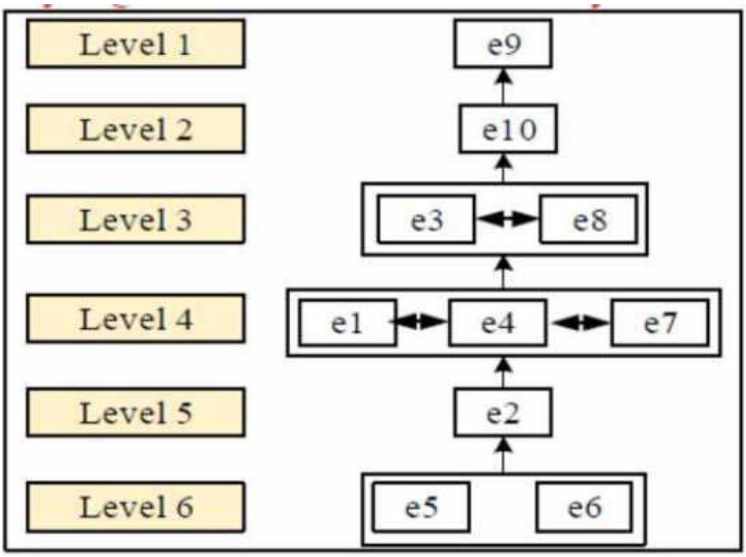


**Fig. 1.** Economic Sub-Elements Hierarchical Structure Model

Making the arrangement of positions in the structural model grouping of the economic sub-elements is carried out sequentially by entering the coordinates of the Driver Power and Dependence values into the calcification image. The results shown by the ISM-VAXO will then be classified in the economic aspect sub-element group as shown in Figure 1.

The ISM-VAXO results illustrate that the position of sub-elements (E5, E6) as key sub-elements in the economic aspect of the leading furniture SMEs in Jombang is at level 6 (the highest level) based on the largest total DP value. All of the sub-elements of the economic aspect are classified according to the level of driver power (DP) and the level of dependency (D). can be seen in Figure 2.

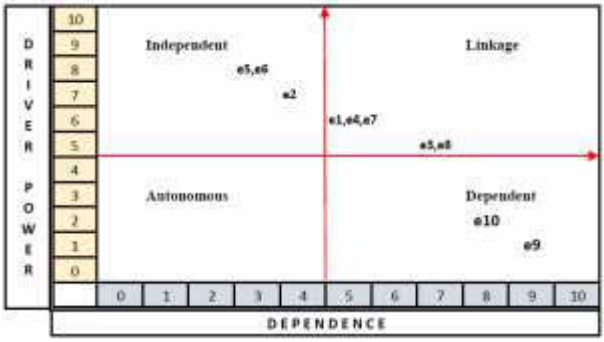


**Fig. 2.** Classification of Economic Aspect Sub-Elements

The results of the classification in Figure 2 illustrate that there are no sub-elements of the economic aspect that are in quadrant I (Autonomous = 0). In the Linkage quadrant there are sub elements E1, E3, E4, E7 and E8, so a careful study is carried out because they have an unstable relationship, but are very related and have an impact on other variables, especially in the Dependent quadrant variable. The classification also shows that the Dependent quadrant is occupied by sub-elements E2, E5, and E6, which are dependent variables that depend on the input and action corrections delivered in the system (Independent quadrant) with independent variables (E10, E9)

### 3.3 Social Aspect Element Simulation

The results of the SWOT analysis show that based on the social aspect elements, then the social aspect sub-elements are made, there are 10 sub-elements as follows:

S1. Stakeholder needs for SME products.
S2. Limited technology for production activities.
S3. Increased demand for wood for households/housing.
S4. Partnership with other parties in terms of capital, marketing and technology
S5. Growing public awareness of environmentally friendly production.
S6. Product protection by YLKI (Indonesian Consumers Foundation).
S7. Fostering the motivation of human resources in the field of production and marketing.
S8. Ownership of community forest land area is limited.
S9. Control during a pandemic to prevent the spread of the Covid 19 virus.
S10. Communities/consumers who use products according to their needs.

Based on studies from experts/experts on the social aspect of the furniture supply chain reinforcement system consisting of 10 sub-elements, the analysis of the relationship between the social aspect sub-elements of the furniture supply chain reinforcement system was carried out using the ISM-VAXO technique.

**Table 5.** SSIM Matrix – VAXO Social Aspect Elements

| Ei \ Ej | s1 | s2 | s3 | s4 | s5 | s6 | s7 | s8 | s9 | s10 |
|---|---|---|---|---|---|---|---|---|---|---|
| s1 | | A | A | A | A | A | X | X | X | V |
| s2 | | | A | A | A | A | A | A | A | V |
| s3 | | | | A | V | O | X | X | A | V |
| s4 | | | | | V | V | O | V | A | V |
| s5 | | | | | | A | A | O | A | V |
| s6 | | | | | | | X | X | A | V |
| s7 | | | | | | | | X | A | V |
| s8 | | | | | | | | | A | V |
| s9 | | | | | | | | | | V |
| s10 | | | | | | | | | | |

Based on the same calculation as the economic element aspect, the results of the analysis based on the overall social aspect sub-elements are classified according to the level of driver power (DP) and the level of dependency (D) into 4 quadrants, namely quadrant I (Autonomous), quadrant II (Dependent), quadrant III (Linkage), and quadrant IV (Independent). The result of the ISM-VAXO matrix model is the grouping of social aspect sub-elements that have a big influence on controlling during a pandemic to prevent the spread of the Covid 19 (S9) virus.

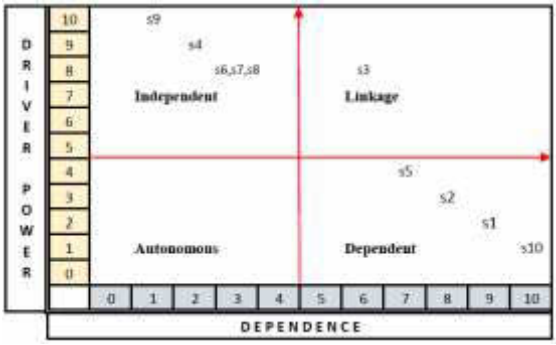


**Fig. 3.** Classification of Social Aspect Sub-Elements

The results of grouping/classifying the sub-elements of the social aspect of the strengthening system in the figure shows that:

1. Quadrant I (Autonomous) is that there are no (0) social aspect sub-elements in this quadrant and is not related to the strengthening of the furniture supply chain system.
2. Quadrant II (Dependent) is a sub-element Stakeholder needs for SME products (S1), Limited technology for production activities (S2), Growing public awareness of environmentally friendly production (S5), and Communities/consumers who use products as needed (S10 ).
3. Quadrant III (Linkage) is a sub-element for increasing the demand for wood for households/housing (S3).

4. Quadrant IV (Independent) is a sub-element, Partnership with other parties in terms of capital, marketing and technology (S4), Protection of product users by YLKI (Indonesian Consumers Foundation) (S6), Increasing motivation of human resources in the field of production and marketing (S7), Ownership of limited community forest land (S8), and Control during a pandemic to prevent the spread of the Covid 19 virus (S9).

### 3.4 Simulation of Elements of Environmental Aspects

In forming the sub-elements of environmental aspects according to the SWOT analysis, there are 11 sub-elements of environmental aspects as follows:

L1. Imposition of activity restrictions during a pandemic in the red zone area.

L2. Perhutani implementing forest activities.

L3. Build community settlements in forest areas according to regulations.

L4. Building institutional development for NGOs concerned with the forest environment.

L5. Determination of rules and policies that provide guarantees for SMEs.

L6. Public awareness of the function of the forest as a regulator of wood supply.

L7. Supervision of the level of spatial planning violations and the forest environment.

L8. Cooperation of furniture SMEs.

L9. Collaboration with the Regional Environmental Agency (BLHD).

L10. Air and water pollution levels in forest environments.

L11. Level of forest destruction and rehabilitation.

Based on studies from experts/experts on the environmental aspects of the furniture supply chain reinforcement system consisting of 11 sub-elements, the analysis of the linkages between the environmental aspects of the sub-elements uses the ISM-VAXO matrix technique. Based on the discussions and opinions of experts, the results are shown in table 6.

**Table 6.** SSIM – VAXO Matrix Elements of Environmental Aspects

| Ei \ Ej | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9 | L10 | L11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | | V | V | O | V | V | O | V | V | V | V |
| L2 | | | A | A | O | O | A | A | A | A | A |
| L3 | | | | V | V | V | V | V | V | V | V |
| L4 | | | | | A | A | A | A | V | V | V |
| L5 | | | | | | X | X | X | V | A | V |
| L6 | | | | | | | X | X | V | V | V |
| L7 | | | | | | | | X | V | V | V |
| L8 | | | | | | | | | V | V | V |
| L9 | | | | | | | | | | A | A |
| L10 | | | | | | | | | | | X |
| L11 | | | | | | | | | | | |

Based on the same calculation as the economic element aspect, the results of the analysis show that all sub-elements of the environmental aspect are classified according to the level of driver power (DP) and the level of dependency (D) into 4

quadrants, namely quadrant I (Autonomous), quadrant II (Dependent) , quadrant III (Linkage) and quadrant IV (Independent). The results based on the ISM-VAXO matrix model show the highest level position (Level 7), namely sub-element (L1) imposing restrictions on community activities during a pandemic in the red zone environment as a key sub-element in the environmental aspect of the furniture SME strengthening system in Jombang.

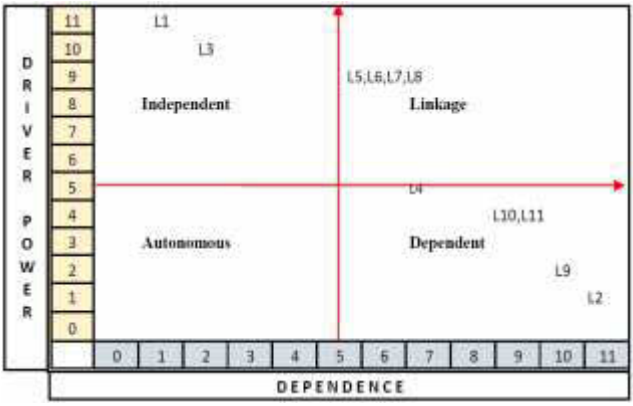


**Fig. 4.** Classification of Sub-Elements of Environmental Aspects

The results of the grouping/classification of the environmental aspects of the strengthening system sub-elements in the figure shows that:

1. Quadrant I (Autonomous) is that there are no (0) sub-elements of environmental aspects in this quadrant and it is not related to the strengthening of the furniture supply chain system.
2. Quadrant II (Dependent) is the Perhutani sub-element implementing Forest activities (L2), Building institutional development for NGOs concerned with the forest environment (L4), Collaborating with the Regional Environmental Agency (BLHD) (L9), Levels of air and water pollution in forest environments ( L10), and Level of forest destruction and rehabilitation (L11).
3. Quadrant III (Linkage) is a sub-element for setting rules and policies that provide guarantees for SMEs (L5), community awareness of the function of the forest as a regulator of wood availability (L6), monitoring of the level of violations of spatial planning and the forest environment (L7), and work the same as UKM furniture (L8).
4. Quadrant IV (Independent) is the sub-element Imposing restrictions on community activities during a pandemic in the red zone environment. (L1) and build community settlements in forest areas according to regulations (L3).

## 4 Conclusion

Based on the results of the analysis using the ISM method in supporting the strengthening of the supply chain in a sustainable manner which is reviewed based on

economic, social and environmental aspects. The results of the analysis in terms of economic aspects/elements show that the highest level as a key sub-element is support from financial institutions for business capital (E5) and support for the Office of Industry & Trade (E6), while the next level is increasing the welfare of employees and SMEs (E2). In terms of social elements, the key sub-element is Control during a pandemic to prevent the spread of the Covid 19 virus (S9) and the next sub-element Partnership with other parties in terms of capital, marketing and technology (S4). Implementation of activities to support a sustainable supply chain based on the social aspect is that the government must exercise control during a marketing pandemic using a digital marketing system. In terms of environmental elements, the key sub-element is that it is necessary to impose restrictions on community activities during a pandemic in the red zone environmental areas. (L1) and build community settlements in forest areas according to regulations (L3). Implementation of activities must refer to government programs in the framework of preventing the Covid 19 virus by imposing restrictions on community activities by not holding mass gatherings in a place that will facilitate the spread of the Covid 19 virus.

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