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KEY FACTORS OF EDUCATION IMPROVEMENT IN THE COASTAL VILLAGE OF MADURA USING THE MICMAC (MATRIX OF CROSS IMPACT ANALYSIS) METHOD

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Abstract

Community welfare is one measure of the success of a government. Sustainable welfare is influenced by the quality of human resources. Human quality indicators are measured by 3 dimensions, namely health, education and economy. Of the 3 dimensions for coastal villages the lowest is the level of education and economy. Solving economic problems is influenced by the level of education. The community's economy will increase along with the increase in education. Therefore this study aims to analyze the key factors in improving education in Madura coastal villages. Research with a quantitative approach with analysis using the MICMAC method. The data was obtained from a questionnaire that had been provided and filled in by experts in the field of education in Madura. The results showed that the key factors ranked in the top 5 for improving education in Madura Coastal Villages were a) School fees, b) Parental support, c) Environmental factors in coastal communities, d) counseling on the importance of education and e) parental support. To improve education in Madura coastal villages, it is suggested 1) There is a free school policy for primary and secondary education; 2) scholarship program for higher education; 3) social environment with social aspect empowerment programs; 4) natural environment with economic transformation; 5) counseling program on the importance of continuing education; 6) parental motivation with the success story method from families whose children have become successful people due to increased education.

Keywords: Community education, MICMAC Analysis, Madura Coastal Village, Human Resources.

INTRODUCTION

Community welfare is the main goal that we want to achieve together. Community welfare is also a one measure of the success of a government. Where welfare is also measured by starting from the economy, health and education. According to Rosni (2017), families with a higher level of welfare mean that they have a better quality of life, so that in the end the family is able to create better conditions to be able to improve their welfare. With the existing resources, it is time for coastal communities to be much more prosperous than now.

According to Dewi (2016), Indonesia has a very unique character where in Indonesia there are many natural resources that other countries do not have. Indonesia's geographical location is on the equator and flanked by two continents and two oceans. The sea area and the many natural islands of Indonesia are assets that are not owned by other countries. The potential of natural

The Seybold Report
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resources should be utilized for the welfare of society. The considerable wealth of natural resources is supported by ecosystems which include coral reefs, seaweed, mangrove forests.

One of the reasons for the low level of welfare is the lack of qualified human resources in the area, especially the younger generation, who have not been able to see opportunities and take advantage of the natural resources in their area. According to one of the studies from Dwiyana I.M.A, (2019), the condition of coastal communities is still far behind from the conditions of other communities, backwardness is measured from all aspects such as health, income, existing facilities in coastal areas and others. The many opportunities in the field of fisheries, especially in coastal areas, must really be utilized for the social welfare of the people in the area. For example, making cooperatives for fishermen, developing educational tourism on the coast, culinary processing of coastal food, developing education and establishing research centers in coastal areas and many other opportunities. Opportunities like this are what we want to provide in an extension so that coastal communities, especially the younger generation, can read about opportunities in their area.

Seeing these natural resources have potential and have high economic value which results in the welfare of coastal communities. Welfare in this coastal area is still relatively low when compared to other regions. In fact, if we look at the natural resources on the coast, the welfare of the area should be good. In addition to health and the economy, there are important aspects that need to be improved in coastal areas, namely the education aspect. In the education sector, the government's targets are set out in Presidential Decree no. 59/2017 concerning village-based sustainable development point 4 which reads "Ensuring equality of quality education and increasing learning opportunities for everyone, guaranteeing inclusive and equitable education and encouraging lifelong learning opportunities for all". But in reality educational facilities in coastal areas are still minimal.

Research here will be taken in the coastal village of Madura. HR in Madura is still lagging behind compared to regencies/cities in East Java when viewed from the HDI figures for 2020 and 2021. In 2020 and 2021 the HDI figures from 4 districts in Madura are still below the average for East Java which has an average 71.71 and 72.14. Sampang Regency has the lowest HDI rate in East Java with a rate of 62.7 in 2020 and rises to 62.8 in 2021. Bangkalan Regency has an HDI rate of 64.11 and 64.36 in 2021. Pamekasan Regency has an HDI rate of 66, 26 and 66.4 in 2021. Sumenep Regency has HDI figures of 66.43 and 67.04 in 2021 (BPS, 2022). The cause of the low HDI itself is in the education indicator. Four districts in Madura have education indicators below the average in East Java and one of them has the lowest education indicator. Therefore, it is necessary to increase education in Madura, especially in coastal villages.

To improve the education sector in Madura coastal villages, we cannot only look at it from one point of view. So it needs an in-depth analysis to improve the education of coastal communities. The analysis that we can use in improving coastal sector education is the MICMAC analysis. The MICMAC analysis method was first introduced in 1973 by Michael Godet and Dupperin. MICMAC functions to analyze several elements in the system in sequence according to the level of influence and influence. The MICMAC approach also enables the analytical thinking

The Seybold Report
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of researchers to solve problems systematically. The MICMAC application plays the role of analyzing variables that can be influenced or affect a problem system which can later be ranked (Fauzi, 2019). The choice of Micmac analysis is because this analysis method will help identify variables that are influential or dependent which are important for a system (Soesanto, 2021).

MATERIAL AND METHOD

The method and type of this research is quantitative with a sequential explanatory approach using MICMAC analysis. According to Hassall, et.al., (2021), Sequential Explanatory is a quantitative method which is followed up with qualitative analysis. In this research, there are two data. The data needed are primary data and secondary data. The primary data in this study is data obtained from experts who are involved in the world of education, especially in the education of coastal communities. The primary data that is being sought is numerical data and population variables to improve the education of the Madura coastal community which will be filled in by experts. Respondents in this study were 30 respondents consisting of the Head and staff of the Education Office in Madura, Head of the Office of the Ministry of Religion in Madura, Branch Heads of the East Java Education Office in the Madura region, Board of Education in Madura, Volunteer Mandala Senom, Volunteer Compok Literasi Madura. Determination of respondents in this study is to use purposive sampling method. According to Sugiyono, (2016), this sampling technique uses certain considerations to adapt to data needs. Respondents in this study provided information and expert views on the educational conditions of coastal village communities in Madura.

RESULTS AND DISCUSSION

MICMAC analysis

MICMAC analysis helps researchers to identify variables that influence or are influenced by other variables in improving a goal (Soesanto, 2021). MICMAC analysis in this study to determine opportunities and variables that can increase the level of education in Madura coastal villages. MICMAC analysis has been widely used as a research analysis including. For example Research by Megawanto et.al., (2020), discusses the problems of Indonesian capture fisheries which still shackle the Indonesian state. There are 3 main problems in capture fisheries in Indonesia including poverty, overfishing and damage to marine ecosystems. If seen from the three of them still have complex interrelationships, therefore it requires a MICMAC analysis method approach to determine the dependence of the variables that influence the problems of Indonesian capture fisheries. So, it can help the government in making policies regarding these problems. From the results of this study it was found that the most influential variables based on the Matrix of Direct Influences and the Matrix of Indirect Influences included capture fisheries production, IUU fishing, capture fisheries policies, and fishing costs.

Research by Siraj et.al., (2021), uses the MICMAC application as a determinant of classification to find out useful humanitarian elements and can be included in the education curriculum. The results of the MICMAC analysis show that there are 19 humanitarian elements that need to be included in the children's early education curriculum. The 19 elements of

ISSN 1533-9211

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humanity are divided into 4 quadrants. The first quadrant is unaffected by other elements, the second quadrant is dependent on other elements, the third quadrant has a weak dependence on other elements and the fourth quadrant has a weak influence and requires maximum attention.

a) Soesanto's research, (2021), uses MICMAC analysis as an analysis to find out the key variables that shape regional competitiveness. The results of Soesanto's research show that there are 2 key variables that trigger sustainable regional competitiveness. Two key variables include variables in the market category, namely market efficiency and access to finance. The regional strengthening variables are institutions and infrastructure. The results of the MICMAC analysis from Soesanto's research can be used as comparative material from the mapping of regional competitiveness index variables that have been released by the Ministry of Research and Technology/National Agency for Research and Innovation.

b) Actors and Objectives

The determination of educational variables is determined by experts who understand the situation in the coastal education sector in Madura. Experts in this study include:

1. Head and staff of Education Office in Madura
2. Head of the Office of the Ministry of Religion in Madura
3. Branch Head of the East Java Education Office, Madura region
4. Board of Education in Madura
5. Volunteer Mandala Senom
6. Voluntary Literacy Compok Madura

As for several variables according to experts that have the opportunity to improve the education of the people of Madura Coastal Village as in Table1.

Table 1: Variables of Education Improvement in Madura Coastal Villages

Number	Variable (long name)	Short name
1	Income of coastal families	Icf
2	School fees	Sf
3	Helping parents	Hp
4	Distance to school	Ds
5	Transportation costs	Tc
6	Location of schools	Ls
7	Parental support	Ps
8	Family motivation	Fm
9	Parents' education in coastal communities	Pecc
10	Environmental factors in coastal communities	Efcc

ISSN 1533-9211

DOI 10.5281/zenodo.7450374

11	Motivation of coastal children	Mcc
12	Number of schools in coastal areas	Nsca
13	Coastal educational facilities and infrastructure	Cefi
14	Information on available scholarships in coastal areas	Iasca
15	Educational counseling from stakeholders	Ecs

Source: Research Results, 2022

Calculate from MDI

MDI is the initial matrix that is input in the MICMAC application. The MDI value ranges from 0-3 which is filled in by experts in the desired data field. This value is used to determine the influence and influence of a variable on other variables. The results of filling out the initial MDI questionnaire will later be processed by the Micmac application and the influence map and dependencies will be known according to the quadrant occupied by the variable (Ariyani & Fauzi, 2019). In this study, researchers want to know the variables that have the opportunity to improve education in coastal villages of Madura. The questionnaire in this study was filled in by stakeholders from the Madura Education Office. Here's MDI on research opportunities for improving education in coastal villages of Madura.

Stability

According to Megawanto et.al., (2020), good matrix stability is around 100%. Matrix Stability or MDI Stability here follows the suggestions from the number iteration available in the MICMAC application according to the data to be processed in the MICMAC application. The stability of the variable influence and the dependent variable being assessed is the last iteration. The value of the last iteration can then be concluded into a good stability matrix or not.

Based on the results of MDI stability that has been processed by the MICMAC application, it is suggested that the number of iterations is 2, so the number of iterations on MDI stability is 2 times. The stability matrix shows that from 2 iterations the stability value of the influence variable is 98% and the stability value of the dependence variable is 100%. These results indicate that the matrix has good stability because it is in the range of 100%.

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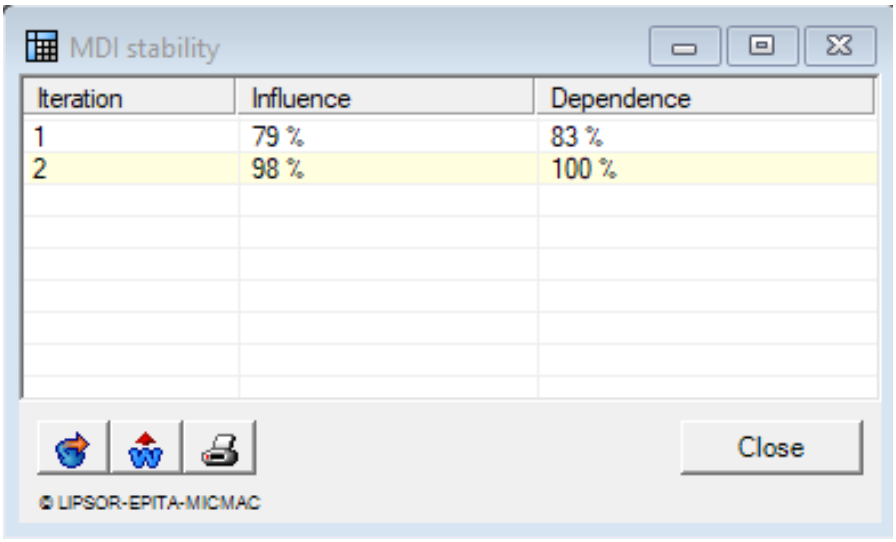

Figure 1: MDI stability

Direct Influence/Dependence Map

Each variable has a role that can be identified by the MICMAC application on the Direct Influence/Dependence Map. In the Direct Influence/Dependence Map it is divided into 4 quadrants. The variable in quadrant one is the trigger variable. Variables in the 2nd quadrant are variables that can affect the system if it gets intervention. Variables in quadrant 3 are variables that are influenced or affected by other variables. Whereas in quadrant 4, the variables in it have little effect on other variables (Putra & Pramesti., 2019).

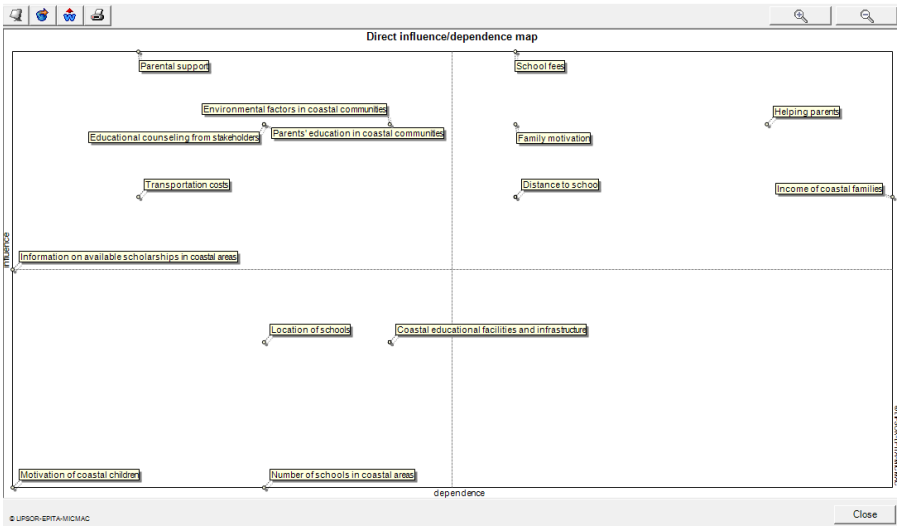

Figure 2: Direct Influence/Dependence Map MDI

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Based on the direct map analysis results in Figure 2, quadrant 1 (influence) is Parental support (Ps), Transportation costs (Tc), educational outreach from stakeholders, coastal environmental factors and parental education in coastal communities. Quadrant 2 (relay) has variables on school fees (Sf), family motivation (Fm), distance to school (Ds), helping parents (Hp) and Income of coastal families (Icf). Quadrant 3 (dependence) has no variables. Quadrant 4 (autonomous) contains variables of coastal educational facilities and infrastructure (Cefi), location of school (Ls), number of schools in coastal areas (Nsca) and motivation of coastal children (Mcc).

Direct Influence Graph

The MDI direct influence graph shows the interrelationships between variables, both variables that influence or are influenced by other variables. The shape of the dotted line shows the variables that have a very weak influence. The shape of the black line shows the variables that have a weak influence. The shape of the thin blue line shows the variables that have moderate influence. The shape of the thick blue line shows the variables that have a strong. The shape of the red line shows the variables that have a very strong influence. Based on the data list of sort by influence variables in the MDI Matrix section, the variable that has the most influence on other variables is the variable school fees (Sf) and is most influenced by the variable income of coastal families (Icf). While the variable that has the lowest influence is the distance to school (Ds) variable and is most affected by the available information on available scholarships in coastal areas (Iasca) (Figure 3)**.**

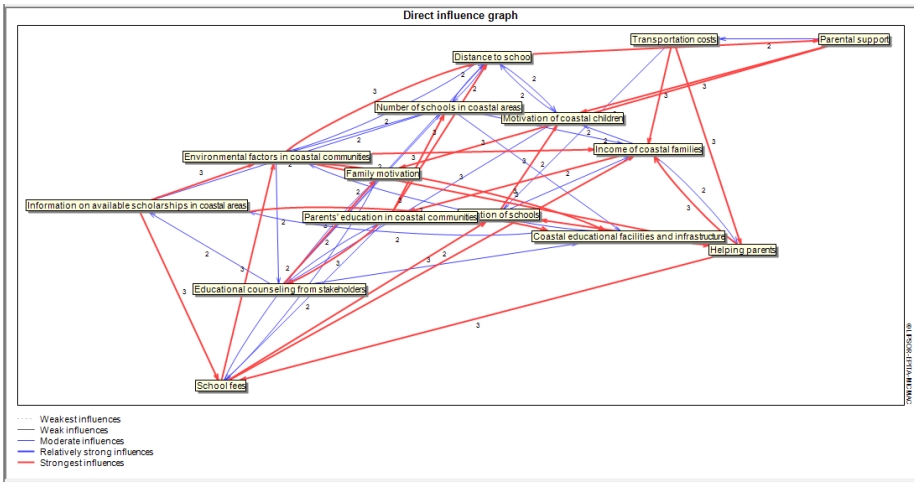

Figure 3: Direct Influence Graph MDI

Calculate from MII

Testing the stability of grouping variables based on direct influence, an analysis of the indirect effect of variables is carried out by observing the dynamics of the influence map and variable dependency, if there is a change in the position of the variable that quite a lot of direct effect mapping then shows the mapping results and low system stability. Indirect influence analysis

The Seybold Report
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is explained in the MII matrix (Matrix of Indirect Influence) resulting from the transitivity process of the direct influence matrix (MDI) (Ariyani & Fauzi, 2019). The Matrix of Indirect Influence here is a change from the MDI which has included indirect influence variables. The following is MII on an analysis of improving the education of coastal village communities in Madura which has been processed in the MICMAC application.

Indirect Influence/Dependence Map

The Indirect Influence Graph MII shows the change in the categorization of the variables included in each quadrant after the dependence variable is entered. Based on the observed data, in quadrant 1 there are variables of parental support (Ps), information on available scholarships in coastl areas (Iasca), transportation costs (Tc), parents' education in coastal communities (Pecc), educational counseling from stakeholders (Ecs) and Environmental factors in coastal communities (efcc). Quadrant 2 contains variables of family motivation (Fm), distance to school (Ds), school fees (Sf), helping parents (Hp) and income of coastal families (Icf). Quadrant 3 has no variables. In quadrant 4 there are variables of school location, coastal education facilities and infrastructure, number of schools in coastal areas (Nsca) and motivation of coastal children (Mcc).

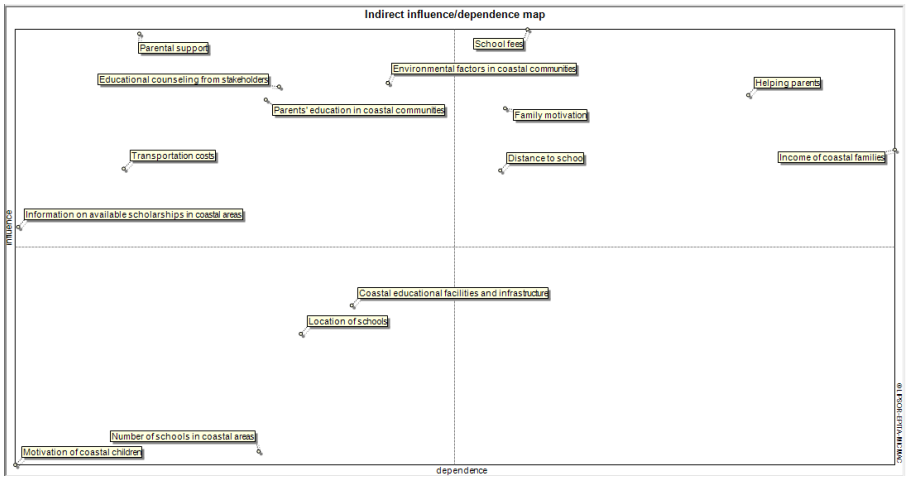

Figure 4: Inderect Influence/Dependence Map MII

Indirect Influence Graph

In the Indirect influence graph MII Matrix, the indirect influence on the direct variables has been included. The shape of the dotted line shows the variables that have a very weak influence. The shape of the black line shows the variables that have a weak influence. The shape of the thin blue line shows the variables that have moderate influence. The shape of the thick blue line shows the variables that have a strong. The shape of the red line shows the variables that have a very strong influence. Based on the data list of sort by influence variables in the MII Matrix section above, the variable that most influences other variables is the coastal family income variable. Based on the sort by dependence variable list data in the MII Matrix section

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above, the variable that is highly dependent on the variable is also occupied by the income variable of the coastal family**.**

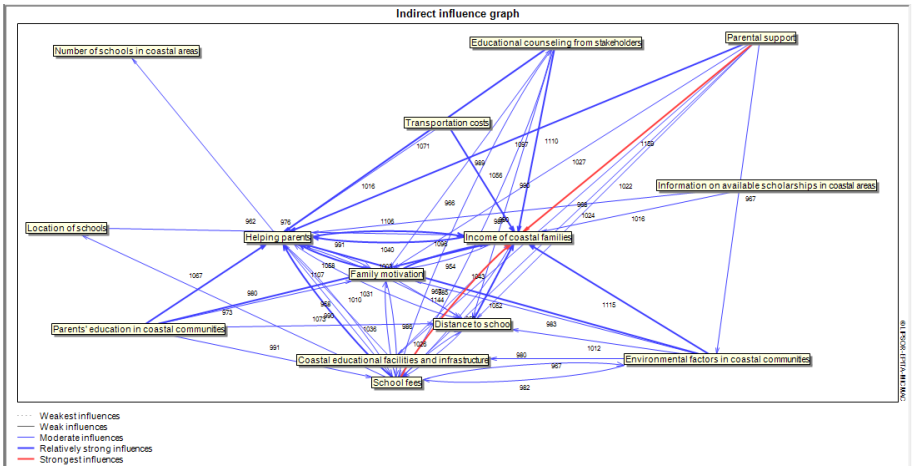

Figure 5: Inderct Influence Graph MII

List variable sort by influence

Based on the sort by influence variable list data in the MDI Matrix section above, the order of variables that most influence other variables starts from school fees (Sf), parental support (Ps), helping parents (Hp), family motivation (Fm), parents' education in coastal communities (Pecc), environmental factors in coastal communities (Efcc), educational counseling from stakeholders (Ecs), income of coastal families (Icf), distance to school (Ds), transportation costs (Tc), information on available scholarships in coastal areas (Iasca), location of schools (Ls), coastal educational facilities and infrastructure (Cefi), motivation of coastal children (Mcc), number of schools in coastal areas (Nsca).

Based on the sort by influence variable list data in the MII Matrix section above, there is a sequence of variables that most influence other variables, namely school fees (Sf), parental support (Ps), environmental factors, Educational counseling from stakeholders (Ecs), coastal community parental motivation, coastal community parental education, Family motivation (Fm), coastal family income, Transportation costs (Tc), school mileage, information on available scholarships in coastal areas (Iasca), Coastal educational facilities and infrastructure (Cefi), school location, number of schools available in coastal areas, coastal children's motivation**.**

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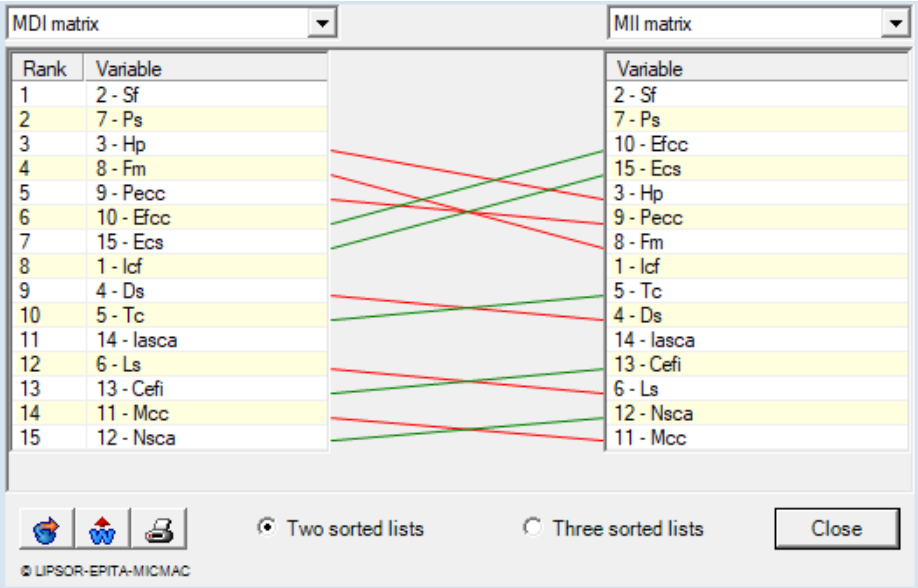

Figure 6: List variable sort by influence

List variable sort by dependence

Based on the order of variables that are highly dependent on other variables according to the list of variables sort by dependence in the MDI Matrix section, namely the variables of coastal family income, helping parents (Hp), school fees (Sf), distance to school (Ds) , Family motivation (Fm), environmental factors in coastal communities (Efcc), Coastal educational facilities and infrastructure (Cefi), location of school (Ls), parents' education in coastal communities (Pecc), number of schools in coastal areas (Nsca), educational counseling from stakeholders (Ecs), transportation costs (Tc), parents' education in coastal communities (Pecc), Motivation of coastal children (Mcc), information on available scholarships in coastal areas (Iasca).

Based on the order of variables that are highly dependent according to the list of variables sort by dependence in the MII Matrix section, namely income of coastal families (Icf), helping parents (Hp), school fees (Sf), family motivation (Fm), distance to school (Ds), environmental factors in coastal communities (Efcc), Coastal educational facilities and infrastructure (Cefi), location of school (Ls), educational counseling from stakeholders (Ecs). Parents' education in coastal communities (Pecc), number of schools in coastal areas (Nsca), parental support (Ps), transportation costs (Tc), information on available scholarships in the coastal environment, motivation of coastal children (Mcc).

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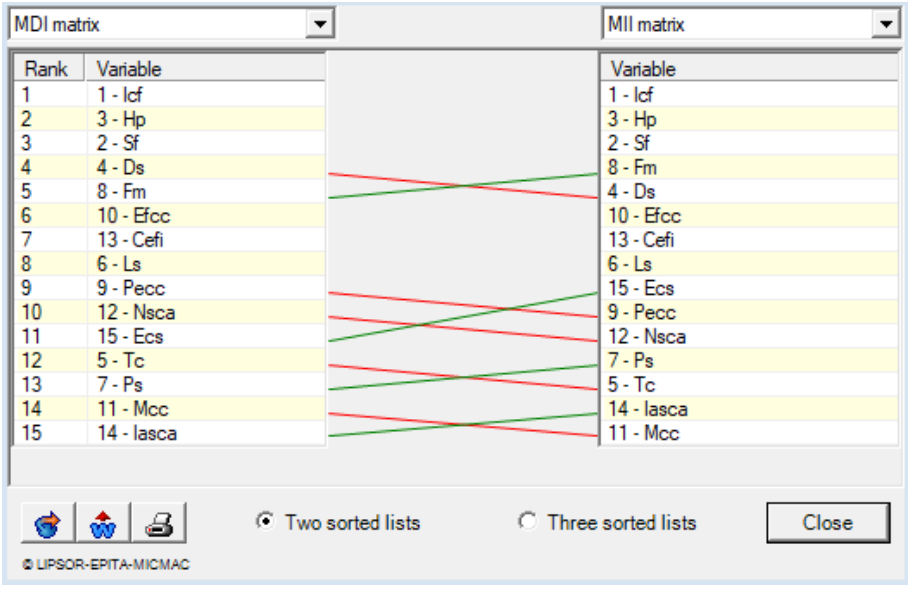

Figure 7: List variable sort by dependence

Displacement Maps

The displacement map is a change from MDI to MII. Changes that occur in the Displacement map are the positions of the variables in the quadrant when indirect effects are included (Megawanto, et.al., 2020). Based on the displacement map above, the variables that experience shifts between quadrants are scholarship information available in the coastal environment. As for what is significant but is still in its own quadrant, namely the Location of schools (Ls) and coastal educational infrastructure (Cefi)**.**

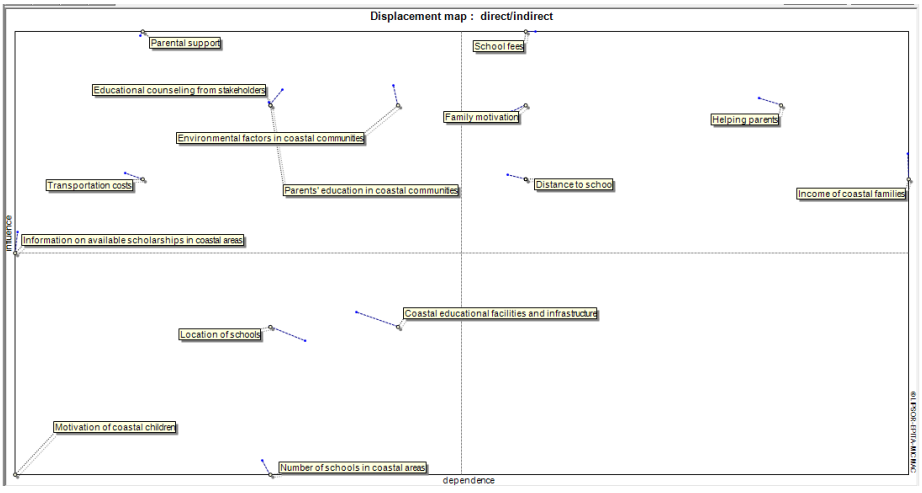

Figure 8: Displacement Map

The Seybold Report
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Discussion

The results of the MICMAC analysis of school fees and family income are the most influential and influenced variables. According to research by Astuti, Sion, & Erang, (2021), fishermen's income influences the education of children in traditional fishing families. Because the higher the level of education a child achieves, the more money parents have to pay. If you look at the two important variables, the main factors that influence education are the economic factors of the Madura coast. According to (Jailani, 2019), students from higher socioeconomic backgrounds tend to perform better in academics than those from lower socioeconomic backgrounds. Students with low socioeconomic status tend to drop out of school. The economic factor also includes an effect on parental support. According to Sinaga, (2018), student education will be disrupted in the educational process when the role of parents is not going well. From this it can also be concluded that the role of parents in supporting children's education is very important. With the support of parents and sufficient school fees, children are not burdened with the existing costs. They are more able to express themselves in channeling their talents in the world of their education.

Other variables that have an influence on increasing the education of coastal communities according to the findings are the distance to schools and the number of schools. This will also have an effect on cost overruns. The distance between schools that are far away will cause an increase in education costs. According to research (Susanti & Hidayat, 2020), so far more complete educational facilities have been found in big cities. So it's not surprising that education in coastal villages that are far from the city tends to be lower than villages/kelurahans that are close to the city center.

CONCLUSION

The results of the analysis of increasing education in the coastal villages of Madura were obtained, 15 variables that had an effect on improving the education sector in the coastal villages of Madura. Based on data from the MICMAC analysis, the 3 most influential variables were obtained before entering the indirect effect, namely school fees (Sf), parental support (Ps), and helping parents (Hp). After entering the indirect influence there is a change in position 3 where helping parents (Hp) is replaced by environmental factors. While the most dependent variable is the income of coastal families (Icf), helping parents (Hp), school fees (Sf). In the top 3 positions there is no change.

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The Seybold Report
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