
COMPARISON OF THE MAMDANI AND SUGENO METHOD TO INCREASE THE LEVEL OF ANALYSIS THE ADVANTAGES OF INFRASTRUCTURE DEVELOPMENT

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Abstract

Article Info	To increase the accuracy of the output value of a Mamdani-based decision support system compared to the manual analysis system. The value of the analysis carried out using the system should have a value close to the value that is done manually. For this reason, this study will compare Mamdani and Sugeno methods to observe the similarity of values with manual calculation data. In processing fuzzy input data produces output from the inference process which is then classified in 5 feasibility conditions, namely, low, normal, high, very high and not feasible which is used as a supporting facility in making infrastructure development decisions in an area
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Abstract.

1. INTRODUCTION

The increasingly rapid development of the era triggered the government's performance in terms of equitable development in each region in Indonesia. Infrastructure development in each region is one of the government's efforts to improve the welfare of the Indonesian people. So that to see an infrastructure development in an area that is really beneficial to improve the welfare of the people around it, it is necessary to design a computer application that can analyze the benefits of infrastructure development that has been implemented in an area that is in accordance with government objectives and shows a percentage value that represents the level of prosperity of the local people after infrastructure development was carried out.

This system is an analysis of the benefits of infrastructure development based on fuzzy logic that shows the level of feasibility of infrastructure development in an area, so that it is expected to facilitate officers working to evaluate infrastructure development in an area in determining which areas can be used as development priorities and which areas need to be evaluated re-building the project.

2. METHOD

2.1 Formation of fuzzy rules

After the formation of fuzzy variables and sets, the following rules are formed in accordance with the benefit analysis data.

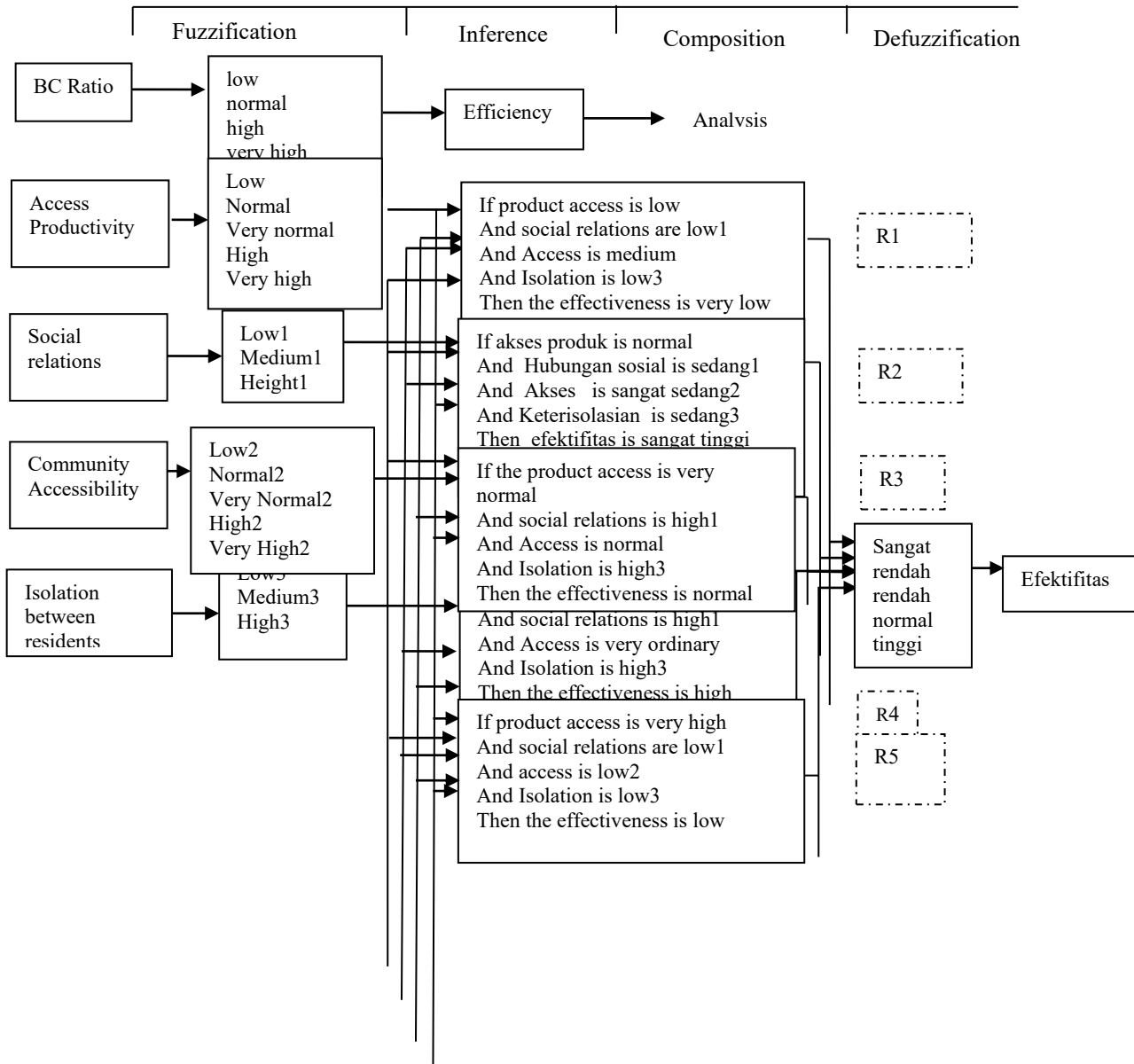


Figure 1 Inference 1 Aspects of Efficiency and Effectiveness

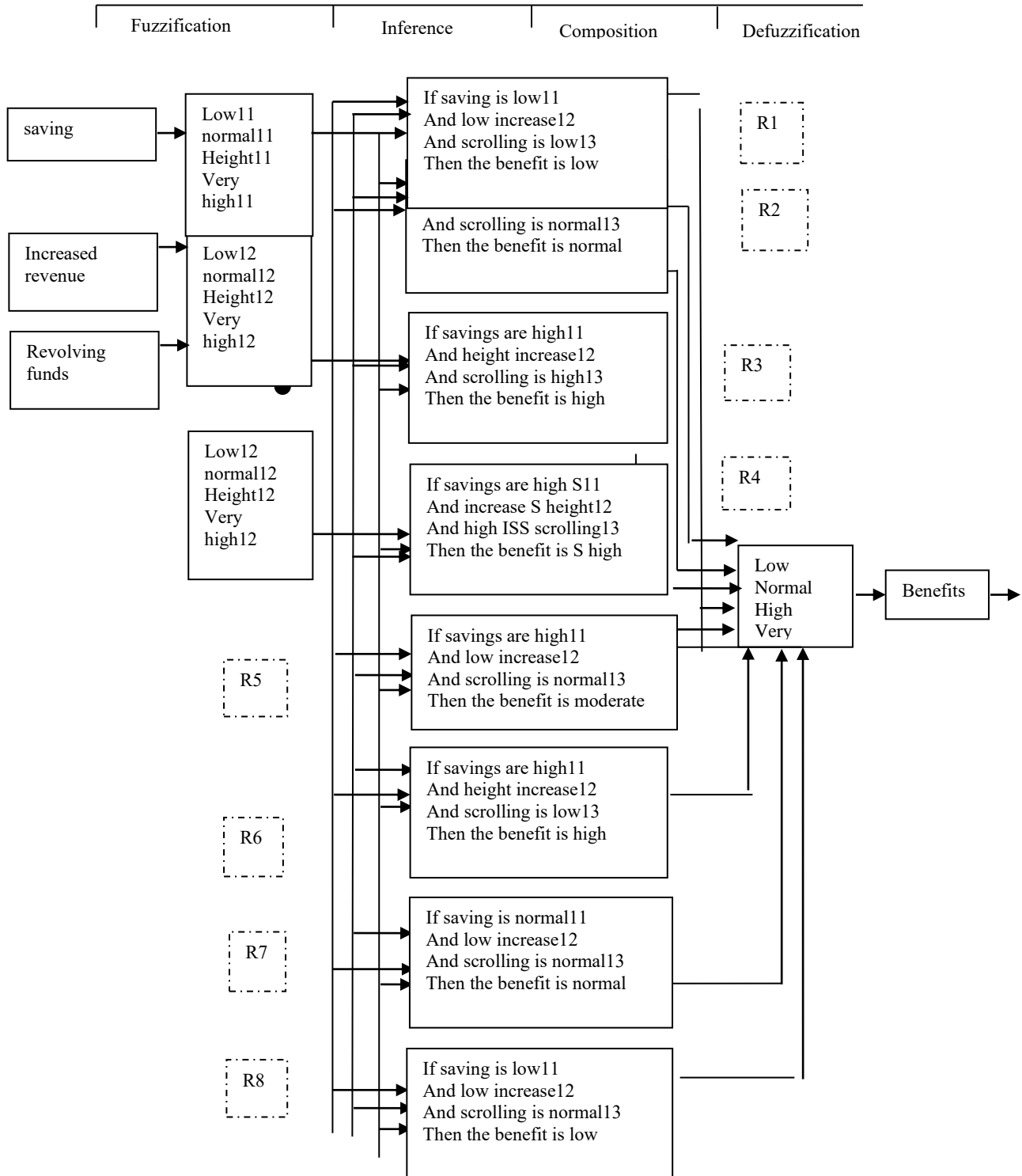


Figure 2 Inference 1 Benefits Aspect

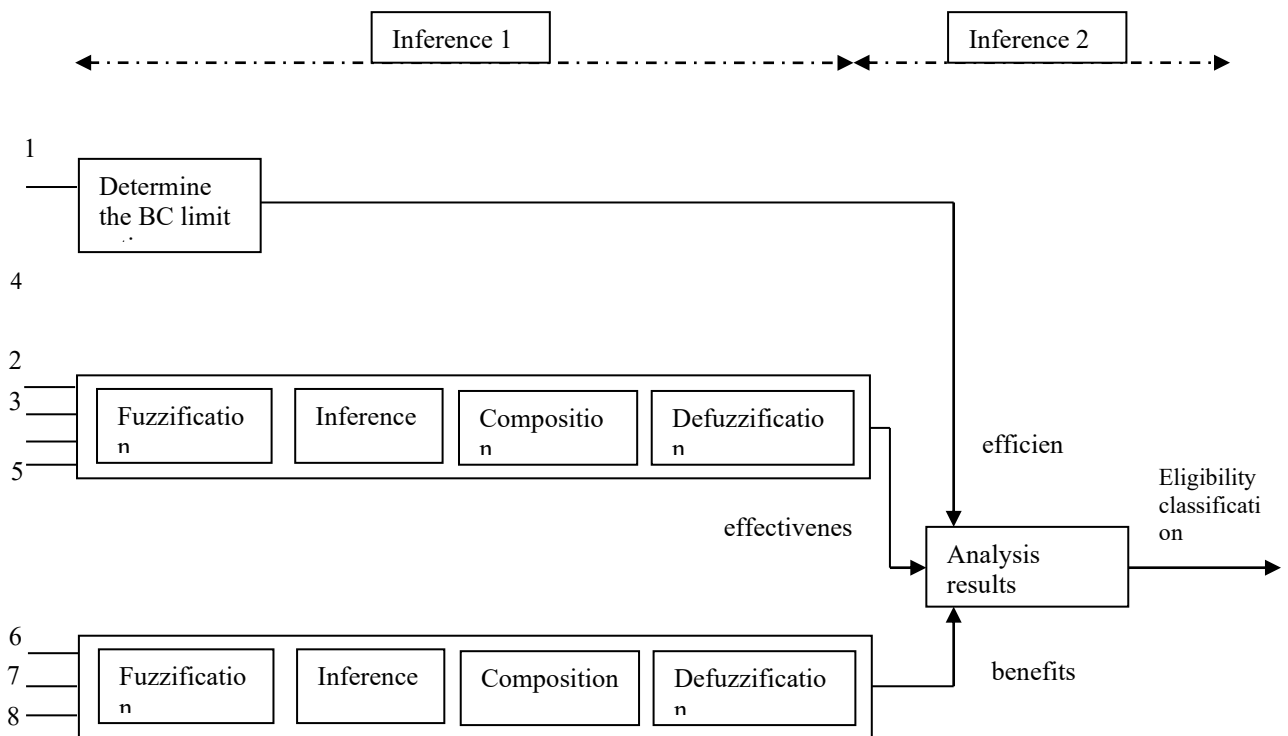


Figure 3. Fuzzy Analysis of the Benefits of Infrastructure Development

Figure 3 is a picture of the feasibility classification of the analysis of the benefits of infrastructure development consisting of 2 phases of inference derived from the input set of fuzzy values. Inference 1 is the process of determining the level of effectiveness, efficiency and benefits, then the second inference determines the feasibility classification of the results of the analysis of development benefits. Savings and output data. Simulation of the analysis of the benefits of infrastructure development using fuzzy logic with the mamdani method (centroid) will provide convenience for officers (users) in analyzing the results of the benefits of infrastructure development in a region and classifying it into 5 conditions. Furthermore, the system will provide several outputs to the officers (users) in the form of analysis results so that this will be an evaluation and consideration material whether the development can be continued or needs to be re-evaluated.

3. RESULT AND DISCUSSION

The results of the simulation analysis of the benefits of infrastructure development using fuzzy logic with the mamdani method (centroid) are built using the fuzzy logic toolbox with GUI (Graphical User Interface) facilities so that it can be seen the following aspects of benefit inference Figure 4 used sugeno method.

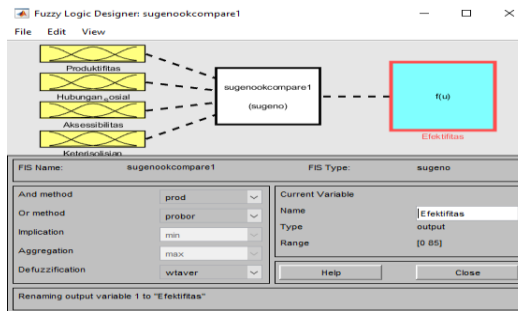


Figure 4 Variabel input and variable output used sugeno

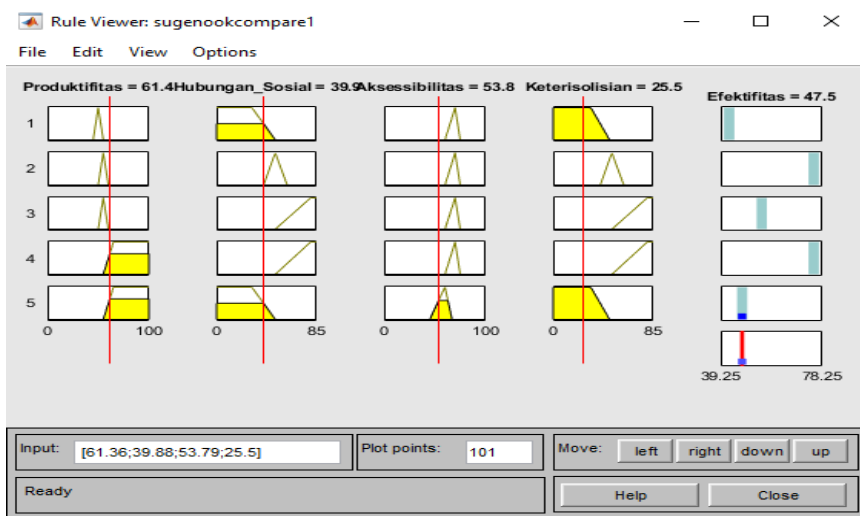


Figure 5 Rules and inference fuzzy set

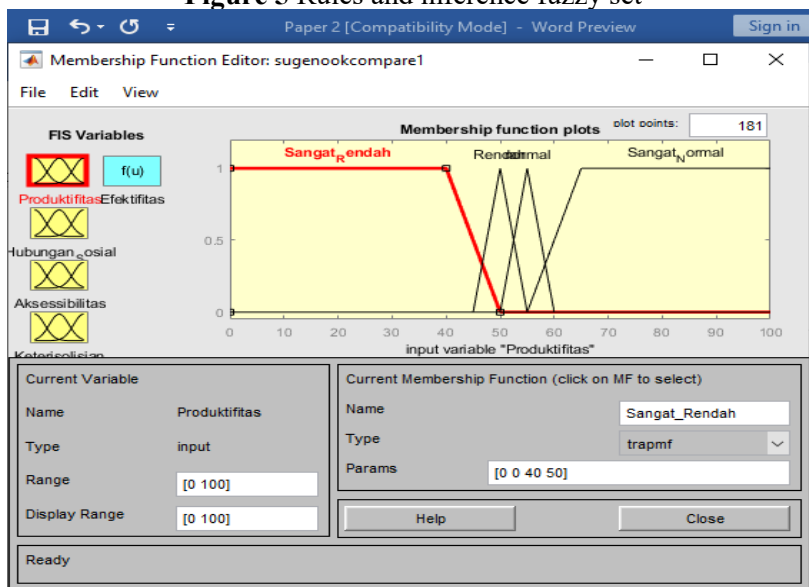


Figure 6 Input variable Produktivitas membership function fuzzy

The membership function of the output of effectiveness can be seen in Figure 7, where the membership function consists of 4 conditions, namely low, medium, normal and high. In these conditions use the trapmf type curve for low and high conditions, while for moderate and normal conditions use the trimf type curve, namely triangle. Figure 8 data training used same data input and

comparing three method such as sugeno, mamadani and manually analysis. Based on data training data values of Mamdani close to analysis values than sugeno.

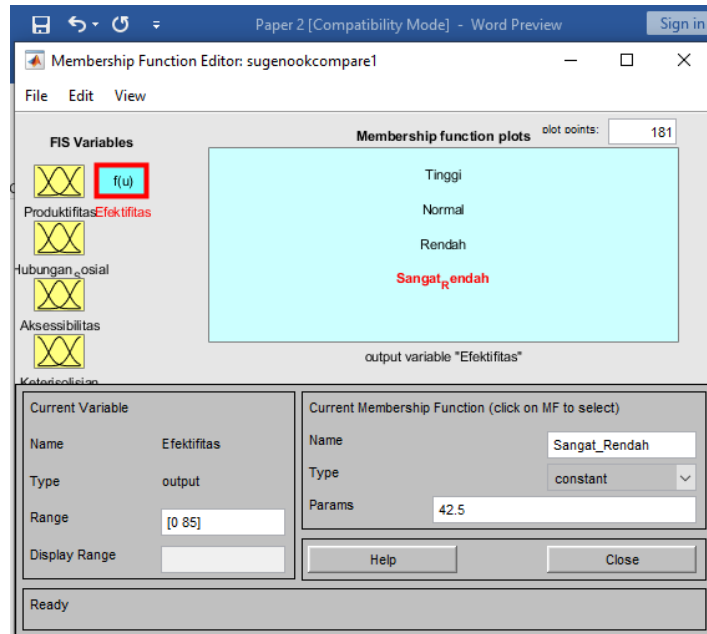


Figure 7 Membership function output variabel efecctivitas

Table 8 Data training use Mamdani and sugeno method

Variabel	Training 1			Training 2			Training 3		
	Mam	Sug	Ana	Mam	Sugeno	Ana	Mam	Sug	Ana
Akses productivity	58.3	58.3	58.3	70.5	70.5	70.5	61.4	61.4	61.4
Social relations	63.4	63.4	63.4	60.8	60.8	60.8	39.9	39.9	39.9
Community accessibility	78	78	78	64.4	64.4	64.4	53.8	53.8	53.8
Isolation	60.8	60.8	60.8	50.3	50.3	50.3	25.5	25.5	25.5
Effectiveness	75.6	42.5	70.5	42.5	75	35.6	47.5	47.5	40.5

4. CONCLUSION

The conclusions that can be drawn from this research are : Variabel Effectivitas value closer to the analysis value than sugeno. For Development Infrastructure analysis rekomendes used Mamdani method to get a good value. Base on training effectiveness value show value constant

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