# Rule of Land Potential for Paddy Use Rough Set Method

**Susi Darmawaningsih*[1], Sugianto[2], Sulis Ni'matun Naharin[3], Wiwit Wiji Lestari[4], Rizka Rizqi Robby[5]**

[1,2,3,4,5]Department of Mathematic, Universitas Nahdlatul Ulama, Blitar, Indonesia
e-mail: **\*[1]susidarma1@gmail.com**, [2]sugianto.unu@gmail.com, [3]sulisnaharin23@gmail.com, [4]wiwitwinda123@gmail.com, [5]rizka.ertiga@gmail.com

***Abstrak***

*Kabupaten Blitar menjadi salah satu kabupaten di Jawa Timur dengan keadaan tanah sebagian besar merupakan tanah vulkanik yang baik dimanfaatkan sebagai lahan pertanian. Pertanian menjadi salah satu sektor prioritas yang ada di Kabupaten Blitar dan didukung dengan kultur, kondisi geografis serta banyaknya masyarakat yang bermatapencaharian sebagai petani. Oleh karena itu, diperlukan adanya sebuah cara untuk mengetahui kemungkinan suatu wilayah berpotensi komoditas padi. Sehingga diharapkan dengan penelitian ini dapat membantu pemerintah Kabupaten Blitar agar mampu memaksimalkan jumlah produksi komoditas padi di Kabupaten Blitar dengan banyaknya petani yang ada. Metode Rough Set mampu menghasilkan informasi berupa pola aturan (rule) yang dapat menentukan wilayah potensi komoditas padi di Kabupaten Blitar dengan menggunakan faktor luas panen, jumlah produksi, dan jumlah petani per-Kecamatan. Penelitian ini, tidak hanya dilakukan secara analitik tetapi juga menggunakan bantuan dari software Rosetta untuk menguji analisis data secara analitik menggunakan metode Rough Set. Hasil penelitian ini berupa rule sebanyak 38 rule yang dapat menjelaskan kemungkinan wilayah berdasarkan 3 atribut keputusan yaitu: berpotensi, kurang berpotensi, dan tidak berpotensi. Untuk wilayah yang memiliki kemungkinan besar berpotensi komoditas padi berdasarkan rule yang sudah terbentuk adalah wilayah yang memiliki luas panen yang luas, jumlah produksi yang banyak, dan jumlah petani yang sedikit.*

***Kata kunci***—*Kabupaten Blitar, komoditas padi, Rough Set, rule, Software Rosetta*

***Abstract***

*Blitar district has become one of the many cities in Java the land situation is largely a good soil of vuikanik to be used as farmland. Agriculture is one of the priority sectors in Blitar district and is supported by culture, geographical conditions and the number of people whose livelihoods are farmers.Hence, it requires a way of knowing where a region might have a potential paddy commodity. It is hoped that the government of blitar will be able to make the best use of the number of paddy commodities produced in blitar district with the many farmers available. A rough set is able to produce information with a rule pattern (rule) which can determine the potential areas for paddy commodities in Blitar district by using factors of harvested area, production amount, and number of farmers per sub-district. This research is not only done analytically but also help from Rosetta's software to test analytic data analysis use rough set. The result of this study is rule as many as 38 rule that can explain the possibility of stake based on the 3 decision attributes: potential, low potential, and not potential. For those areas there is a good chance paddy commodity potential area based on the rules that have been formed is area have a large crop, a large amount of paddy produced, and a small number of farmers.*

***Keywords***—*Blitar District, paddy comodity, Rough Set, rule, Rosetta's software*

# 1. INTRODUCTION

Blitar was the region next to the island of Java and was one of the most complex patents in the east Java province. The location that was in under the volcanic foot hills of Kelud Mountaint made most of the region in the Blitar district imbued with volcanic soil, containing ash volcanic eruptions, sand and napal (limestone mixed with clay). The soil is generally a yellowish gray, salty and sensitive to erosion. This latter land is called regosol, which can be used to grow paddy, sugarcane, tobacco, and vegetable crops, irrigation. It's good and effective because it's channeled by the Brantas and Leso rivers. Then, utilized by two DAMS (Wlingi Raya and Serut), which encourage agriculture to produce paddy and corn.

On the other hand, the country's agricultural sector, which has become a priority for the region, has been covered with food and holticultura, forestry and agriculture. On the other hand, there has been a heavy trend in the global growth reaching 47%. [1] According to the statistical office (BPS) East Java (2018), employees in the agricultural sector at blitar have a percentage of 44.09% or 275,897 of the population of 625,720. From data BPS the agricultural sector  there is a strong market of most people in Blitar. Increased economic growth can, to some extent, influence inequality between regional development and discrimination against rural areas and the agricultural sector[2]. Equitable distribution of the agricultural sector in the future is very necessary for the distribution of community specially food necessity.

The paddy (Oryza Sativa L.) is a plant that comes from two continents that is Asia and tropical West Africa and subtropical. The cultivation of the own paddy had begun in Zhejiang, China [2] in 3,000 B.C. Paddy is also a key food item in Indonesia, and it has become a strategic commodity. Blitar district is a potential area of paddy commodity, due in part the great region of blitar district had fertile soil so it was good for her planting paddy. The latest paddy commodity in the blitar district will need blitar to help analyze the potential areas of paddy commodity.

Predictions or forecasting are among the applications of mathematics in daily life, one of the forecasting methods of rough set [3]. Rough set is one of the methods in the mathematics of dealing with the vang's ambiguity introduced to mixing uncertainty and misinformation. It can produce new information there is a rule pattern (rule) that can be used in the development of a potential area of paddy commodity in the blitar district. The purpose of the rough set analysis is to get a brief rule estimate of some known factors [4]. So using rough set may help predict the potential areas of paddy commodity in the blitar district by using crop yields, agricultural areas, and many farmers within a region.

# 2. METHODS

In determining the region of potential paddy commodity existing in Blitar district there will be used one of the methods in data mining which is rough set.

## 2.1 Data Mining

[5] Data mining called Knowlegde Discovery in Database (KDD) it is a vang activity associated with data collection, historical data use to find knowledge, information, regularity, pattern or relationship in large data. Output in data mining alternative in decision-making in the future. Data mining is not a standing field of science on my own, but very connected with other sciences like databases, statistic, information searching, dan artificial intelligent. Data mining are grouped by function and purpose, which is as follows.

1. Description, intended to find/identify a recurring pattern and turn that pattern into a rule that can be used to facilitate an activity. One of the algorithms in the description is the apriori algorithm.

2. Classification, grouping on classification based on the relationship between criterion variable with target variable. Algorithms that run deep clarification is a Cart, ID3, C4.5, J48, C5.0, *nearest neighboor*, *naïve bayes*, etc.

3. Predictions, which are one of the data mining that is often used to predict the future over data before. The algorithm is *Rough Set*, Chart, ID3, C4.5, J48, dan C5.0.

4. Estimates, in classifications it is virtually classified. The difference lies in a grouping form, where the numerical cluster estimates. The algorithm is linear regression simple, linear regression, etcetera.

5. Clustering, in classifying it as being similar or homogeneous to the data form of observations, data records, or classes and objects of a similar nature. In numeration differs from classification by not using variable decisions. The algorithm included in the library is the k-Means, K-medoids, K-Nears Neighboo, etcetera.

6. Associations, are groups, himpuan, unity, or fellowship. Data-mining processes are attribute searches that appear or always surface at the same time. Great opportunities for attribute to arise simultaneously are measured by reducing confidence value. The algorithm included in the association is association rule.

*2.2 Rough set*

A rough set is a mathematical technique developed by Pawlack in 1980 [6]. Rough set one of those data-mining techniques Used for Uncertainty issues, Imprecision and Vagueness in application Artificial Intelligence (AI). Rough set is an efficient technique for the knowledge discovery in database (KDD) inside stage of process and data mining [7].

The purpose of a rough analysis set is to get a short rule estimate from a table Results from a rough set analyst can be used in the process of data mining and knowledge discovery [5]. Here's a hard set set set rule:

Rough sets offers two forms of data representation information System (IS) dan Decision System (DS) [8].

1. Information system

Information system (IS) is a chart composed of a line that represents data and columns that represent attributes or variable from data. Information system on data mining known as dataset name. Information Sistem is Information Sistem (IS) is a pair $IS = \{U, A\}$, where $U = \{E_1, E_2, \ldots, E_m\}$ dan $A = \{A_1, A_2, \ldots, A_n\}$ are a bunch examples and sequential patterns.

2. Decision System

Decision system is information system with additional attributes which are called decision attribute, in data mining, it is known as the class or target. Decision system represents the result of a known classification. Decision system is a function that describes information system, where : $DS = \{U, (A, C)\}$, where $U = \{E_1, E_2, \ldots, E_m\}$ and $A = \{A_1, A_2, \ldots, A_n\}$ and $C = \{C_1, C_2, \ldots, C_p\}$. Where is the $U$ object and $A$ Attribute Condition while $C$ Decision Attribute.

The research method used by researchers in carrying out research these are as follows:

1. Literature Study Method

Study literature is collecting data and information from the literature by reading and studying books, literature, articles, as well as materials of a theoretical nature, learning obtained in lectures or general, as well as other sources of information related to research.

2. Data Collection Method

Data collection in this study used secondary data. Secondary data was obtained from the Department of Agriculture and Food of Blitar Regency. The data collected is compiled to get clear data results in the form of numbers.

3. Data Processing Method

The data processing method uses the rough set method to determine the rule in determining the potential area for paddy commodities in Kab. Blitar. The steps taken in data processing are as follows:
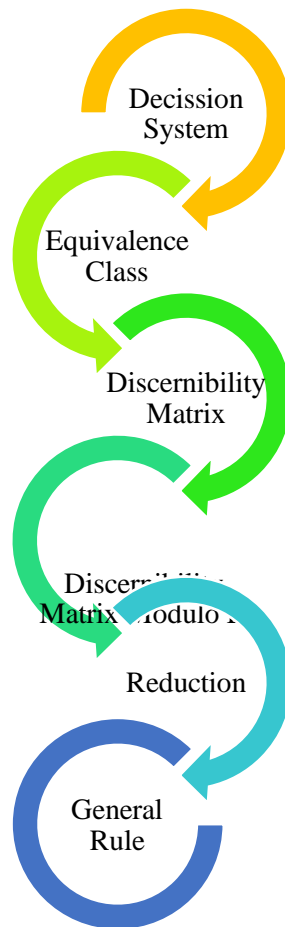


Picture 1 Flow Chart

a. Decission System

   Decision system is information system with an additional attribute called a decision attribute, in data mining is known as class name or target. This attribute represents the results of a known classification.

b. Equivalance Class

   Grouping the same objects allows the same conditions/criteria means the same data by criteria does not arise more than 1 (one) time, or only 1 (1) times, so that there is less data..

c. Discerbility Matrix

   The search process distinguishes value attributes from conditions/criteria between data on Equivalence Classes (EC). The search process has formed data. Equiequiments Class (EC), condition/criterion attributes changed in form variables such as A.B.C or each other. Data on Equivalence Classes (EC). Converted to a matrix with the same number of columns and lines as the numbers in the Equivalence Class (EC). Find the difference in attribute values between data in the Equivalence Class (EC), and write different attributes to variable shapes.

d. Discerbility Matrix Modulo D

   Discerbility Matrix Modulo D is a continuation of Discerbility Matrix, if Discerbility Matrix value the same criteria/condition attributes then its value is expunged, then the value of those attributes is erased, only the disparity is retained.

e.  Ruduction
    Variable values are not eliminated in the Discerbility Matrix Modulo D process, being a
    mathematical equation with so many variables. To simplify tension uses the Prime
    Implicant function Boolean law.
f.  General Rule
    General Rule is a process rule  based on values variables derived from the simplification
    of mathematical equations with Boolean law. Building rule of vaitu by adjusting the data
    on the Equivalence Class (EC), variable atribut kriteria/kondisi the variable attributes of
    the criteria/conditions the simplification results have been directly linked to Decision
    Attribute.

    The study uses software help to test the truth from the rule generated on data analysis using
rough set. Test rules on this study using Rosetta's software.


## 3.  RESULTS AND DISCUSSION


    In rough sets, a set is represented as a table. Where the rows in the table represent objects
and columns represent attributes of those objects.Attributes of the objects. The chart called
information svstem vang can be described as:

$$S = (U, A)$$

where U are an infinite set of infinite objects called by universe and A are a set of infinite infinite
attributes from which:

$$a: U \rightarrow Va$$

for each $a \in A$. Set called value set from $a$. This is information system paddy commodity data:

Table 1 Information System

| No | District | Harvest Area | Quantity Production | Number of Farmers |
|----|----------|--------------|---------------------|-------------------|
| 1 | Bakung | 1,823 | 8,715 | 5,101 |
| 2 | Wonotirto | 1,435 | 6,797 | 7,153 |
| 3 | Panggungrejo | 1,318 | 6,663 | 11,157 |
| 4 | Wates | 1,563 | 7,819 | 7,579 |
| 5 | Binangun | 196 | 1,188 | 9,844 |
| 6 | Sutojayan | 2,489 | 17,413 | 4,708 |
| 7 | Kademangan | 3,092 | 17,622 | 7,254 |
| 8 | Kanigoro | 1,979 | 13,880 | 4,183 |
| 9 | Talun | 1,990 | 14,229 | 5,502 |
| 10 | Selopuro | 3,733 | 24,958 | 3,643 |
| 11 | Kesamben | 4,710 | 33,544 | 4,504 |
| 12 | Selorejo | 2,991 | 21,342 | 3,942 |
| 13 | Doko | 4,085 | 27,500 | 4,503 |
| 14 | Wlingi | 4,143 | 28,988 | 2,834 |
| 15 | Gandusari | 3,811 | 26,553 | 5,253 |
| 16 | Garum | 2,892 | 19,419 | 4,409 |
| 17 | Nglegok | 1,845 | 13,084 | 3,961 |
| 18 | Sanankulon | 1,422 | 10,349 | 3,078 |
| 19 | Ponggok | 1,236 | 7,756 | 5,558 |
| 20 | Srengat | 1,654 | 10,833 | 3,964 |
| 21 | Wonodadi | 1,913 | 12,710 | 3,059 |
| 22 | Udanawu | 1,184 | 8,854 | 4,148 |

In the table above U is (Bakung, Wonotirto,Panggungrejo, Wates, Binangun, Sutojayan, Kanigoro, Talun, Selopuro, Kesamben, Selorejo, Doko, Wlingi, Gandusari, Garum, Nglegok, Sanankulon, Ponggok, Srengat, Wonodadi, Udanawu) is a set of subdistricts in blitar district. While A is {harvest area, quantity production, number of farmers} which is the set of potential commodity attributes.

In the use of the information system, there is an outcome of known classifications called decision attributes. Information system that is called the decision system. The decision system can be described as:

$$S = (U, A \cup \{d\})$$

Where $d \neq A$ is a decision attribute. The decision table can be seen in the chart:

Table 2 Decision System

| No | District | Harvest Area | Quantity Production | Number of Farmers | Potential |
|---|---|---|---|---|---|
| 1 | Bakung | Moderate | Small | Moderate | Not potential |
| 2 | Wonotirto | Narrow | Small | High | Not potential |
| 3 | Panggungrejo | Narrow | Small | High | Lack of potential |
| 4 | Wates | Narrow | Small | High | Not potential |
| 5 | Binangun | Narrow | Small | High | Not potential |
| 6 | Sutojayan | Moderate | Moderate | Moderate | Lack of potential |
| 7 | Kademangan | Large | Moderate | High | Lack of potential |
| 8 | Kanigoro | Moderate | Moderate | Moderate | Lack of potential |
| 9 | Talun | Moderate | Moderate | Moderate | Lack of potential |
| 10 | Selopuro | Large | Great | Small | Potential |
| 11 | Kesamben | Large | Great | Moderate | Potential |
| 12 | Selorejo | Moderate | Great | Moderate | Lack of potential |
| 13 | Doko | Large | Great | Moderate | Potential |
| 14 | Wlingi | Large | Great | Small | Potential |
| 15 | Gandusari | Large | Great | Moderate | Potential |
| 16 | Garum | Moderate | Moderate | Moderate | Lack of potential |
| 17 | Nglegok | Moderate | Moderate | Moderate | Lack of potential |
| 18 | Sanankulon | Narrow | Small | Small | Not potential |
| 19 | Ponggok | Narrow | Small | Moderate | Not potential |
| 20 | Srengat | Narrow | Small | Moderate | Not potential |
| 21 | Wonodadi | Moderate | Moderate | Small | Lack of potential |
| 22 | Udanawu | Narrow | Small | Moderate | Not potential |

In the table, attribute A has expanded attributes, namely the Potential attribute which is decision attribute of the decision system. Potential attribute have three decision that is Potential, Lack of potential, and Potential. The purpose of the attribute decision if Potential means the area has high potential in producing paddy, Less Potential means the area has lack of potential in producing paddy, and No Potential means the area has no potential in producing paddy.

Next determine equivalence class. Equivalence class is same objects category for attribute $A \in (U, A)$. So the decision system table obtained equivalence class {EC1-EC11} as following the table:

Table 3 Equivalence Class

| Class | Harvest Area | Quantity Production | Number of Farmers | Decision |
|-------|--------------|---------------------|-------------------|----------|
| EC1 | Moderate | Small | Moderate | Not potential |
| EC2 | Narrow | Small | High | Not potential |
| EC3 | Narrow | Small | High | Lack of potential |
| EC4 | Moderate | Moderate | Moderate | Lack of potential |
| EC5 | Large | Moderate | High | Lack of potential |
| EC6 | Large | Great | Small | Potential |
| EC7 | Large | Great | Moderate | Potential |
| EC8 | Moderate | Great | Moderate | Lack of potential |
| EC9 | Narrow | Small | Small | Not potential |
| EC10 | Narrow | Small | Moderate | Not potential |
| EC11 | Moderate | Moderate | Small | Lack of potential |

From the table above we specify discernibiity matrix, where that data is have the same criteria and be written down only once. So that Discernibility Matrix gets like on the following table:

Table 4 Discernibilty Matrix

| Objek | EC1 | EC2 | EC3 | EC4 | EC5 | EC6 | EC7 | EC8 | EC9 | EC10 | EC11 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| EC1 | X | AC | AC | B | ABC | ABC | AB | B | AC | A | BC |
| EC2 | AC | X | X | ABC | AB | ABC | ABC | ABC | C | C | ABC |
| EC3 | AC | X | X | ABC | AB | ABC | ABC | ABC | C | C | ABC |
| EC4 | B | ABC | ABC | X | AC | ABC | AB | B | ABC | AB | C |
| EC5 | ABC | AB | AB | AC | X | BC | BC | ABC | ABC | ABC | AC |
| EC6 | ABC | ABC | ABC | ABC | BC | X | C | AC | AB | ABC | AB |
| EC7 | AB | ABC | ABC | AB | BC | C | X | A | ABC | AB | ABC |
| EC8 | B | ABC | ABC | B | ABC | AC | A | X | ABC | AB | BC |
| EC9 | AC | C | C | ABC | ABC | AB | ABC | ABC | X | C | AB |
| EC10 | A | C | C | AB | ABC | ABC | AB | AB | C | X | ABC |
| EC11 | BC | ABC | ABC | C | AC | AB | ABC | BC | AB | ABC | X |

The matrix value of wisdom is obtained by comparing each attribute data conditions in the Equivalence Class (EC), if there is a difference in it then the writing on the table by entering variables, while if there is no difference then the writing uses (X), this stage will produce a new table shape which then processes dicernibility matriks modulo D.

Table 5 Discernibilty Matrix Modulo D

| Objek | EC1 | EC2 | EC3 | EC4 | EC5 | EC6 | EC7 | EC8 | EC9 | EC10 | EC11 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| EC1 | X | X | AC | B | ABC | ABC | AB | B | X | X | BC |
| EC2 | X | X | X | ABC | AB | ABC | ABC | ABC | X | X | ABC |
| EC3 | AC | X | X | X | X | ABC | ABC | X | C | C | X |
| EC4 | B | ABC | X | X | X | ABC | AB | X | ABC | AB | X |
| EC5 | ABC | AB | X | X | X | BC | BC | X | ABC | ABC | X |
| EC6 | ABC | ABC | ABC | ABC | BC | X | X | AC | AB | ABC | AB |
| EC7 | AB | ABC | ABC | AB | BC | X | X | A | ABC | AB | ABC |
| EC8 | B | ABC | X | X | X | AC | A | X | ABC | AB | X |
| EC9 | X | X | C | ABC | ABC | AB | ABC | ABC | X | X | AB |
| EC10 | X | X | C | AB | ABC | ABC | AB | AB | X | X | ABC |
| EC11 | BC | ABC | X | X | X | AB | ABC | X | AB | ABC | X |

At this stage continues its existing comparisons on the discenibility matrix tables by adding its comparative value comparing decision value (decision attribute). Workmanship on this stage is the same as the craftsmanship at the discernibility matrix level that is by marking (x) when there is the same decision attribute, and does not mark it (is not removed) when there are no attributes same decision.

Results obtained at the discernibility matrix modulo D akam matrix are used for manufacturing in the reduction stage.

Table 6 Reduct

| CLASS | CNF OF FUNCTION BOOLEAN | REDUCTOIN |
|---|---|---|
| EC1 | (A v C) ^ (B) ^ (A v B v C) ^ (A v B v C) ^ (A v B) ^ (B) ^ (B v C) | {AB, BC} |
| EC2 | (A v B v C) ^ (A v B) ^ (A v B v C) ^ (A v B v C) ^ (A v B v C) ^ (A v B v C) | {A, AB, AC, B, BC} |
| EC3 | (A v C) ^ (A v B v C) ^ (A v B v C) ^ (C) ^ (C) | {AC, BC} |
| EC4 | (B) ^ (A v B v C) ^ (A v B v C) ^ (A v B) ^ (A v B V C) ^ (A v B) | {AB, B} |
| EC5 | (A v B v C) ^ (A v B) ^ (B v C) ^ (B v C) ^ (A v B v C) ^ (A v B v C) | {B, AC, AB, BC, ABC} |
| EC6 | (A v B v C) ^ (A v B v C) ^ (A v B v C) ^ (A v B v C) ^ (B v C) ^ (A v C) ^ (A v B) ^ (A v B v C) ^ (A v B) | {A, AB, ABC} |
| EC7 | (A v B) ^ (A v B v C) ^ (A v B v C) ^ (A v B) ^ (B v C) ^ (A) ^ (A v B v C) ^ (A v B) ^ (A v B v C) | {ABC, AC, AB} |
| EC8 | (B) ^ (A v B v C) ^ (A v C) ^ (A) ^ (A v B v C) ^ (A v B) | {AB} |
| EC9 | (C) ^ (A v B v C) ^ (A v B v C) ^ (A v B) ^ (A v B v C) ^ (A v B v C) ^ (A v B) | {ABC, AC, BC} |
| EC10 | (C) ^ (A v B) ^ (A v B v C) ^ (A v B v C) ^ (A v B) ^ (A v B) ^ (A v B v C) | {ABC, AC, BC} |
| EC11 | (B v C) ^ (A v B v C) ^ (A v B) ^ (A v B v C) ^ (A v B) ^ (A v B v C) | {B, AC} |

The variable value of discernibility matrix modulo dis altered into a common form. The form of an equation that contains a large number of variables needs to be simplified, in simplifying the mathematical equation using prime implicant function Boolean law. The end result of the reduction is a smaller variable, followed by numbering variable variables with predetermined attributes.

After obtaining reduction, conclusions are drawn in the form of rule. Rule based on the variables of the reduction process and is linked with decission attributes by adjusting the table equivalence class. Where:

A = Vast Paddy Harvest
B = Amount of Paddy Produced
C = Number of Farmers

Diperoleh rule sebagai berikut:

1. If the harvest area (A) is narrow, then the decision is of no potential or lack of potential
2. If the harvest is moderate (A), then the decision is of no potential or lack of potential
3. If the harvest is large (A), then its decision is of little potential or potential
4. If production (B) is small, the decision is neither potentially or lacking
5. If production (B) is moderate, then its decision is less potential
6. If production (B) is large, then the decision is lacking potential or potential

7. If the harvest area (A) is narrow and production nunmber (B) is small, then the decision is neither potentially nor lacking
8. If the harvest area (A) is moderate and production number (B) is small, then the decision is not potential
9. If the harvest area (A) is moderate and production number (B) is moderate, then its decision is of little potential
10. If the harvest area (A) is moderate and production number (B) is large, then its decision is less potential
11. If the scope of the harvest (A) is large and the amount of production (B) is moderate, then its decision is of little potential
12. If the extent of the harvest (A) and the amount of production (B) is great, then its decision is potentially
13. If the harvest area (A) is narrow and the number of farmers (C) is small, then the decision is not potential
14. If the harvest area (A) is narrow and the number of farmers (C) is moderate, then the decision is out of the question
15. If the harvest area (A) is narrow and the number of farmers (C) is high, then the decision is of little or no potential
16. If the harvest area (A) is moderate and the number of farmers (C) is small, then the decision is less likely
17. If the harvest is moderate and the number of farmers (C) is moderate, then the decision is of no potential or lack of potential
18. If the crop is large (A) and the number of farmers (C) is small, then its decision is potentially
19. If the harvest is large (A) and the number of farmers (C) is moderate, then its decision is potentially
20. If the harvest is large (A) and the number of farmers (C) is great, then its decision is less likely
21. If production (B) is small and farmers (C) few, then the decision is not potential
22. If production (B) is small and farmers (C) are moderate, then the decision is not potential
23. If production (B) is small and farmers (C) high, it is decided to have little or no potential
24. If production (B) is moderate and farmers (C) is small, then the decision is less potential
25. f the amount of production (B) is moderate and the number of farmers (C) is moderate, the impact is low
26. If production (B) is moderate and farmers (C) is high, then the decision is low in potential
27. If production (B) is large and farmers (C) few, then the decision is potential
28. If the amount of production (B) is high and the number of farmers (C) is moderate, then the decision is to lack the potential or the potential
29. If the harvest was narrow (A), production (B) was small and farmers (C) few, it would not have been a promising one
30. If the harvest is narrow (A), production (B) is small and farmers (C) moderate, then the decision is not potential
31. If the harvest is narrow (A), the production (B) is small and the number of farmers (C) is much, then the decision is neither potentially nor lacking
32. If the harvest is moderate (A), the amount of production (B) is small and the number of farmers (C) is moderate, so the decision is not potential
33. If the harvest is moderate (A), the amount of production (B) and the number of farmers (C) is small, then the decision is less likely
34. If the harvest is moderate (A), the amount of production (B) and the number of farmers (C) is moderate, then the decision is less likely
35. If the harvest is moderate (A), the amount of production (B) is high and the number of farmers (C) is low, hence the decision has little potential
36. If the harvest is large (A) large, the amount of production (B) and the number of farmers (C) is high, then the decision is less likely

37.  If the harvest is big (A), the production amount (B) is large and the number of farmers (C) is small, then the decision is potential

38.  If the harvest is broad (A), the production number (B) is large and the number of farmers (C) is moderate, then the decision is potential

Got 38 of the rules of table decision system with analytic calculations were then done testing data with Rosetta's software. Here are the rules of vang shaped like the pictures below:

| | No name |
|---|---|
| | **Rule** |
| 1 | Jumlah Produksi(sedikit) AND Jumlah Petani(sedang) => Keputusan(tidak berpotensi) |
| 2 | Jumlah Produksi(sedikit) AND Jumlah Petani(banyak) => Keputusan(tidak berpotensi) OR Keputusan(kurang berpotensi) |
| 3 | Jumlah Produksi(sedang) AND Jumlah Petani(sedang) => Keputusan(kurang berpotensi) |
| 4 | Jumlah Produksi(sedang) AND Jumlah Petani(banyak) => Keputusan(kurang berpotensi) |
| 5 | Jumlah Produksi(banyak) AND Jumlah Petani(sedikit) => Keputusan(berpotensi) |
| 6 | Jumlah Produksi(banyak) AND Jumlah Petani(sedang) => Keputusan(berpotensi) OR Keputusan(kurang berpotensi) |
| 7 | Jumlah Produksi(sedikit) AND Jumlah Petani(sedikit) => Keputusan(tidak berpotensi) |
| 8 | Jumlah Produksi(sedang) AND Jumlah Petani(sedikit) => Keputusan(kurang berpotensi) |
| 9 | Luas Panen(sedang) AND Jumlah Petani(sedang) => Keputusan(tidak berpotensi) OR Keputusan(kurang berpotensi) |
| 10 | Luas Panen(sempit) AND Jumlah Petani(banyak) => Keputusan(tidak berpotensi) OR Keputusan(kurang berpotensi) |
| 11 | Luas Panen(luas) AND Jumlah Petani(banyak) => Keputusan(kurang berpotensi) |
| 12 | Luas Panen(luas) AND Jumlah Petani(sedikit) => Keputusan(berpotensi) |
| 13 | Luas Panen(luas) AND Jumlah Petani(sedang) => Keputusan(berpotensi) |
| 14 | Luas Panen(sempit) AND Jumlah Petani(sedikit) => Keputusan(tidak berpotensi) |
| 15 | Luas Panen(sempit) AND Jumlah Petani(sedang) => Keputusan(tidak berpotensi) |
| 16 | Luas Panen(sedang) AND Jumlah Petani(sedikit) => Keputusan(kurang berpotensi) |
| 17 | Luas Panen(sedang) AND Jumlah Produksi(sedikit) AND Jumlah Petani(sedang) => Keputusan(tidak berpotensi) |
| 18 | Luas Panen(sempit) AND Jumlah Produksi(sedikit) AND Jumlah Petani(banyak) => Keputusan(tidak berpotensi) OR Keputusan(kurang berpot |
| 19 | Luas Panen(sedang) AND Jumlah Produksi(sedang) AND Jumlah Petani(sedang) => Keputusan(kurang berpotensi) |
| 20 | Luas Panen(sedang) AND Jumlah Produksi(sedang) AND Jumlah Petani(banyak) => Keputusan(kurang berpotensi) |
| 21 | Luas Panen(luas) AND Jumlah Produksi(banyak) AND Jumlah Petani(sedikit) => Keputusan(berpotensi) |
| 22 | Luas Panen(luas) AND Jumlah Produksi(banyak) AND Jumlah Petani(sedang) => Keputusan(berpotensi) |
| 23 | Luas Panen(sedang) AND Jumlah Produksi(banyak) AND Jumlah Petani(sedang) => Keputusan(kurang berpotensi) |
| 24 | Luas Panen(sempit) AND Jumlah Produksi(sedikit) AND Jumlah Petani(sedikit) => Keputusan(tidak berpotensi) |
| 25 | Luas Panen(sempit) AND Jumlah Produksi(sedikit) AND Jumlah Petani(sedang) => Keputusan(tidak berpotensi) |
| 26 | Luas Panen(sedang) AND Jumlah Produksi(sedang) AND Jumlah Petani(sedikit) => Keputusan(kurang berpotensi) |
| 27 | Luas Panen(sedang) AND Jumlah Produksi(sedikit) => Keputusan(tidak berpotensi) |
| 28 | Luas Panen(sempit) AND Jumlah Produksi(sedikit) => Keputusan(tidak berpotensi) OR Keputusan(kurang berpotensi) |
| 29 | Luas Panen(sedang) AND Jumlah Produksi(sedang) => Keputusan(kurang berpotensi) |
| 30 | Luas Panen(luas) AND Jumlah Produksi(sedang) => Keputusan(kurang berpotensi) |
| 31 | Luas Panen(luas) AND Jumlah Produksi(banyak) => Keputusan(berpotensi) |
| 32 | Luas Panen(sedang) AND Jumlah Produksi(banyak) => Keputusan(kurang berpotensi) |
| 33 | Jumlah Produksi(sedikit) => Keputusan(tidak berpotensi) OR Keputusan(kurang berpotensi) |
| 34 | Jumlah Produksi(sedang) => Keputusan(kurang berpotensi) |
| 35 | Jumlah Produksi(banyak) => Keputusan(berpotensi) OR Keputusan(kurang berpotensi) |
| 36 | Luas Panen(sedang) => Keputusan(tidak berpotensi) OR Keputusan(kurang berpotensi) |
| 37 | Luas Panen(sempit) => Keputusan(tidak berpotensi) OR Keputusan(kurang berpotensi) |
| 38 | Luas Panen(luas) => Keputusan(kurang berpotensi) OR Keputusan(berpotensi) |

Picture 2 Rule Testing Rosetta's Software

# 4. CONCLUSIONS

The research, selecting a rough set predictive method to determine rule of potential paddy commodities in Blitar's district use of the full range of harvest conditions, production number, and farmers. The variable selection (attribute of conditions and decision attributes) used profoundly affects the rules generated. The rules of the new information will guide us in determining the region's potential paddy commodity in blitar district based on the three attributes of decision: potential, low potential, and not potential. As a research obtained 38 rules for determining the region's potential paddy commodity Blitar district with rules for the region that could potentially have a large crop, a large amount of paddy produced, and a small number of

farmers. The results of the analytic research were tested using Rosetta's software. Gained rule number the same and general rule resulting from the reduction process is 38 rule.

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