

G309

Poverty Mappingin Mataram by Multi-Criteria Fuzzy Approach

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Abstract—this research developed a software as a support system to define the poverty level of households in Mataram town. To measure the poverty level of households, we used fourteen attributes of poverty as indicators that are grouped into four sets, i.e., shelter, food, clothing, and other indicator. Multi criteria fuzzy logic method to poverty measurement is used to obtain category of poverty level. The poverty level is grouped into three categories, i.e., near poor, poor, and very poor. Besides, two additional parameters are fuzzy average and fuzzy weight. The fuzzy average is used to determine the category of a poverty attribute whilst the fuzzy weight is used to determine the determinant factor of poverty degree in a sub district or a village region. The result of analysis shows that there are five of fourteen poverty criteria indicated as both very poor category and very strong factors of poverty degree. Moreover, there are eight of fourteen poverty criteria indicated as the poor category. Indeed, only one of fourteen poverty criteria is indicated as near poor category. In conclusion, 93.07% of the households in Mataram town are classified as poor, 6.65% are classified as very poor, and 0.28% are classified as near poor.

Keywords—poverty, multi criteria fuzzy, fuzzy average, fuzzy weight

I. INTRODUCTION

Poverty is still one of the main problems that is faced by Indonesia. In Indonesia, the number of poor people in September 2012 amounted to 28.59 million (11.66 percent) with the composition of poor people in the city of 10.51 million (8.60 percent) and the number of poor people in the village as much as 18.08 million people (14.70 percent) [1]. The province of West Nusa Tenggara (NTB) is one of the 10 provinces with the largest number of poor people in Indonesia. NTB provincial poverty rate remained at position six of the 33 provinces in Indonesia. The number of poor people in September 2012 was 828,330 people (18.02 percent) with the composition of the population of the urban poor in 415,380 people (21.65 percent) and the number of poor people in rural 412,940 people (15.41 percent) [2]. Mataram city also has a number of sizeable poor populations that are equal to 60.636 people (15.41 percent) [3].

Aid delivery of the government's poverty alleviation programs is considered less on target by some of the societies. Actually, it does not mean that it has undesired purposes, but it is mostly caused by the lack of poor people data that consists of the number and addresses. Besides that, generally, each ministry or institution has self definition and criterion about poverty. Consequently, poverty tends to be partially understood, and its alleviation tends to be sectorial. It causes the difficulty of preventing program continuity and the trend of launching the new program that is not the continuation of previous programs. Antecedents of it are the weakness of the method of the poverty rate criteria of the people/household and the region categorized poverty rate criteria. The faced obstacles today are the difficulty of determining people/household poverty rate criteria and the region's poverty rate criteria in Mataram town. Criteria that are used for reckoning poverty rate today, mostly are based on classical method. It is based on score approaches that were done by many researchers [4-7].

Based on the explanation of the problems above, It is urgent to solve a solution by intensive research on developing a criterion model of level poverty that can analyze comprehensively, strongly and accurately the poverty level. A potential approach for these requirements is multi criteria fuzzy logic. Furthermore, this model is implemented in a software that can analyze poverty level and determine the determinant's factors of poverty level. This software is expected as a tool that can help government of Mataram town on the poverty alleviation programs.

II. RELATED WORKS

Poverty is the complex phenomenon that needs holistic approach for developing alleviation program strategy. Effective policies and program's construction for handling several poverty dimensions, especially on the limited resource available, has become a challenging task for government in the world, and also Indonesia. It pushes researchers to study about poverty in urban or rural areas.

Measurement of multidimensional poverty by using weight calculation approach and stated in axiom form of

aggregation procedure for obtaining index classes against inequality of poverty was used in [8]. Fuzzy logic approach to measure poverty that based on monetary variables for differentiating poor and rich people was used in [9]. The methodology for analyzing multi criteria fuzzy for describing poverty structure and presenting structural representation of implication pattern that exists between the poverty descriptors that differ from the specific context scene on a geographical region selected was proposed in [10].

This research used multi criteria fuzzy analysis approach that based on 14 poverty indicators (is taken from Statistics Center Board (*Badan Pusat Statistik (BPS)*)[7]. Next, determining fuzzy poverty criteria becomes clear criteria, and then it can be obtained poverty criteria that close to real situation.

III. METHODOLOGY

The stage of the research was divided into four steps, there were: 1) survey for collecting poor household in Mataram town, 2) Creating a poverty criteria model by multi criteria fuzzy approach, 3) Designing and coding software, and 4) analyzing data by multi criteria fuzzy.

A. Survey of poor household

For obtaining the description of poverty in Mataram town, survey was done on six sub-districts, and 50 villages. The steps of this survey were:

- a. Poor household survey was conducted for obtaining 14 indicators of poverty according to BPS, that was grouped on 4 main groups, there are [7]:
 - (1) Shelter groups
 - a) The type of shelter building floor;
 - b) The wide of shelter building floor;
 - c) The type of shelter building wall;
 - d) The type of toilet facility;
 - e) The source of light
 - (2) Food groups
 - a) Frequency of daily eating;
 - b) Beef/chicken/milk consumption in a week;
 - c) Drinking water source;
 - d) Energy source for daily cooking.
 - (3) Clothing groups

Annual buying of new clothes.
 - (4) Other groups
 - a) Ability for taking medicine;
 - b) Salary of the head of household;
 - c) Highest education of the head of household;
 - d) Ownership of expensive things that more than Rp. 500.000.

Based on those 14 poverty indicators above; therefore, it can be analyzed by multi criteria fuzzy for obtaining:

1. Category of the poor household for each of 14 poverty indicators.
2. Category the poor household with 3 (three) categories, there are: very poor, poor, and near poor on each sub-districts and villages.

3. Dominant poverty indicator that causes the poor household on a villages or sub districts.

b. Sampling technique

Interview is used as sampling method and the smallest unit is a household. By considering with that term, so this measurement approach is called by household approach. The term of household was defined as a person or people that stay on a part of a building or single building and usually eat from a single kitchen.

The steps of collecting data were as below: firstly, the poor household data is taken from the government's Mataram town. Sampling of the poor household use proportional random sampling method. From 74.833 of the available poor household data are taken 2% on each village; therefore, there are 361 obtained poor household. Next, collecting data was conducted by mean of direct interview and fulfilling questionnaire. Choosing household on each village is conducted randomly by considering to household representation in a village.

B. Modelling Poverty Criteria by Multi Criteria Fuzzy Logic Approach

On classical set theorem, A poverty indicator, for example, salary of the head of household, can be only categorized into two states, there are poor (state 1) for the salary that is below poverty line, and rich (state 0) for the salary that is above the poverty line. However, fuzzy set theorem gives more than two states, for example: near poor, poor, and very poor by degree of membership exists in between 0 and 1. Therefore, fuzzy set theorem is appropriate to use for poverty model.

Generally, multi criteria fuzzy that is used in this research are:

- 1) Decide a population of a village A with the number of household observed is n , thus household set is obtained as $A = \{a_1, a_2, a_3, \dots, a_n\}$.
- 2) For each household has poverty criteria attribute k , $X = \{x_1, x_2, x_3, \dots, x_k\}$.
- 3) Membership degree of fuzzy set A from household i^{th} by $(i=1, 2, 3, \dots, n)$ against j^{th} attribute by $(j=1, 2, \dots, m)$ can be defined as:

$$\mu_A(X_j(a_i)) = x_{ij}, 0 \leq x_{ij} \leq 1 \quad (3)$$

where,

$$x_{ij} =$$

1 if household number i does not has attribute number j ,

$x_{ij} = 0$ if household number i has attribute j , and

$0 \leq x_{ij} \leq 1$ if household number i has attribute j by intensity of having on the interval $(0,1)$.

- 4) The degree of membership function of poverty attribute that is cumulative (as salary or wide of floor) from fuzzy set A (set of household) number- i can be calculated by:

$$\mu_{A_j} = \begin{cases} 1 & \text{if } 0 \leq x_{ij} \leq x_{pj} \\ \frac{x_{ij} - x_{pj}}{x_{Rj} - x_{pj}} & \text{if } x_{pj} \leq x_{ij} \leq x_{Rj} \\ 0 & \text{if } x_{ij} \geq x_{Rj} \end{cases} \quad (4)$$

where,

$$\begin{aligned} x_{pj} & \text{ poor limit for variabel } j^{\text{th}} \\ x_{Rj} & \text{ rich limit for variabel } j^{\text{th}} \\ x_{pj} & < x_{Rj} \end{aligned}$$

- 5) The degree of membership for poverty attribute that is qualitative (as floor type or wall type) from fuzzy set A (set of household) number-*i* can be calculated by:

$$\mu_{A_j} = \begin{cases} 1 & \text{if } 0 \leq x_{ij} \leq x_{pj} \\ \frac{x_{Rj}-x_{ij}}{x_{Rj}-x_{pj}} & \text{if } x_{pj} \leq x_{ij} \leq x_{Rj} \\ 0 & \text{if } x_{ij} \geq x_{Rj} \end{cases} \quad (5)$$

where,

$$\begin{aligned} x_{pj} & \text{ poor limit for variable } j^{\text{th}} \\ x_{Rj} & \text{ rich limit for variable } j^{\text{th}} \\ x_{pj} & < x_{Rj} \end{aligned}$$

- 6) Poverty household index from fuzzy set A can be defined as: [11]

$$f(x_i) = \frac{\sum_{j=1}^k \mu(x_{ij})w_j}{\sum_{j=0}^k w_j} \quad (6)$$

where,

i : (1, 2, 3, ..., n)

w_j : weight of attribute number-*j*

$\mu(x_{ij})$: degree of special membership of the

household number-*i* on the attribute number-*j*

- 7) Poverty household index gives a value intervalin 0 – 1; it means that if index value is a closer value to 1, this household is poorer. Defining the class interval for obtaining category of poor household can be calculated by Walpole's formula [7]:

$$Interval = \frac{Nt-NO}{K} \quad (7)$$

where,

Nt : highest value

NO : lowest value

K : number of class

thus,

$$\begin{aligned} Interval &= \frac{1-0}{3} \\ &= 0.33 \end{aligned}$$

Therefore, interval class is obtained:

1. ≥ 0 dan ≤ 0.33 :near poor category
2. $0.33 >$ dan ≤ 0.67 :poor category
3. $0.67 >$ dan < 1 :very poor category

- 8) Village poverty index is calculated based on the average of poor household indexes of village or sub-districts. Classification of village or sub-district poverty indexes follows the classification of category poor household method.
- 9) Determinant factor of poverty level can be measured by the weight of each village or sub-districts poverty attribute[12]:

$$W_j = -\ln \left\{ \frac{1}{n} \sum_{j=1}^k \mu(x_{ij}) \right\} \quad (8)$$

C. Designing and Coding Application Software of Multi Criteria Fuzzy

Application software that was developed in this step was used for analyzing data.

C.1. Database design

Database is used for storing data that had been written on the questionnaire. Questionnaire consists of place recognition, household member, and 14 questions.

C.2 User Interface Design

User interface is a facility on a software that is used to conduct interaction between user and computer. In this research user interface was made under web platform, thus it can be accessed from any computer in the local network. This interface has main function that is used for manipulating data in the database. Therefore user can entry data to database or read stored data.

Fig. 1 shows an interface for viewing the results of the calculation process. It is a list about poverty data that is based on the type of house floor in Ampenan sub-district. This research has 91 interfaces that similar to the interface that is shown in Fig. 1, although those have different type of poverty criteria.

No	Kecamatan	Kelurahan	Jenis Lantai Bangunan Tempat Tinggal							
			Kategori				Fuzzy			
			Mendekati Miskin		Miskin		Sangat Miskin		Average	Weight
Jumlah	Persentase	Jumlah	Persentase	Jumlah	Persentase	Average	Weight			
1	Ampenan	Dayan Peken	4	25	12	75	0	0	0.41	0.9
2		Butaro	1	16.67	4	66.67	1	16.67	0.54	0.61
3		Ampenan Tengah	1	25	2	50	1	25	0.56	0.58
4		Ampenan Utara	1	14.29	5	71.43	1	14.29	0.54	0.62
5		Kebon Sari	2	40	3	60	0	0	0.4	0.92
6		Pajeruk	0	0	11	91.67	1	8.33	0.51	0.68
7		Taman Sari	1	33.33	2	66.67	0	0	0.42	0.88
8		Banjar	2	50	2	50	0	0	0.34	1.06
9		Ampenan Selatan	0	0	5	71.43	2	28.57	0.56	0.59
10		Pejarakan Karya	0	0	10	100	0	0	0.46	0.77
Total			12	16.22	56	75.68	6	8.11	0.47	0.75

Fig. 1. Interface of The Calculation Results

IV. RESULT AND DISCUSSION

A. Poverty Characteristic

Poverty indicator that is used by Statistics Center Board (*Badan Pusat Statistik*, BPS) for detecting poor household is grouped into 4 main groups, there are: shelter, food, clothing, and other.

For obtaining poverty indicators in Mataram town is done by survey on five sub-districts that consists of 50 villages, and the number of samples is 361 respondents. Next, fuzzy method is performed to obtain the description of the poverty level in each village. Besides that, analysis of indicators was done to measure the weight of poverty attribute. This step is performed in every village and sub-districts, and then; determinant factor of poverty is obtained.

B. Shelter Group Indicators

These indicators contain: the type of building floor, the wide of building, the type of building wall, toilet facility, and main light source.

B.1 The Type of Building Floor

Five choices of the floor type are: high-quality ceramics, low quality ceramics, cement, low quality bamboo/wood, and ground floor. The choice can be a combination of them. Average value of this choice is mapped to fuzzy set by equation (5).

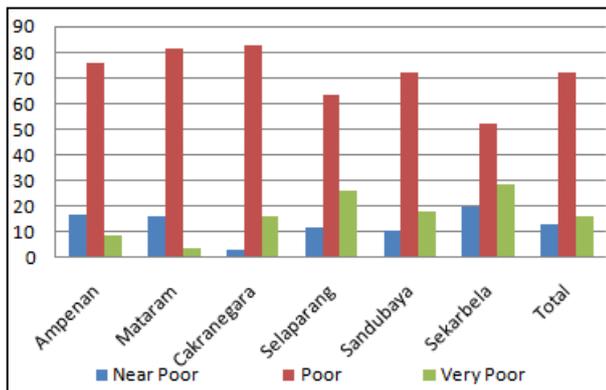


Fig. 3. Percentages of Sub-districts poor household composition Based on The type of building floor in Mataram.

Based on the chart shown in Fig. 3, the type of building floor criteria shows poor household in Mataram majority in poor category. Poor category has 71.75% and contrast, near poor is 12.74% and very poor is 15.51%.

B.2 The Wide of Shelter Building

The second indicator in this group is the wide of shelter building that is a quantitative criterion. The limit of poverty is given that is 3 m²/person, whereas the limit of wealth is 9 m²/person. The value of floor wide is divided by the number of family member, and then it is mapped to be fuzzy set by equation (4) for obtaining the degree of its membership.

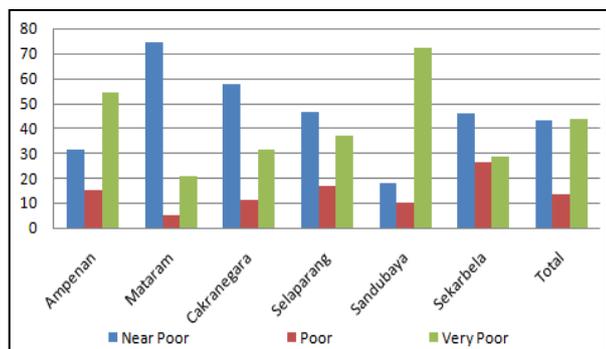


Fig. 4. Percentages of Sub-districts poor household composition Based on The wide of building floor in Mataram

B.3 The type of Shelter Building Wall

The third criterion of this group is the type of shelter building wall. There are 5 choices for the type of wall: medium or high-quality wall, wall without plaster, medium or low-quality wood, bamboo, and sago pal

leaves. Respondent is permitted to choose more than one of them and then the average of this combination is mapped to fuzzy set by equation (5).

Based on Fig. 5, the result of analysis of this indicator is known that there are 67.87%, 26.04%, and 6.09%, of poor households are included in category near poor, poor, and very poor.

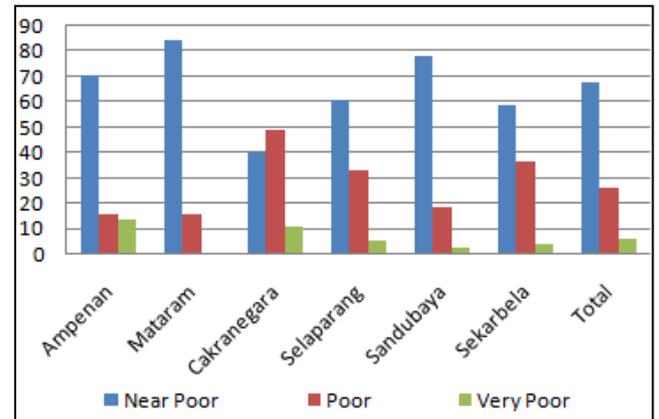


Fig. 5. Percentages of Sub-districts poor household composition Based on The type of building wall in Mataram.

B.4. Toilet Facility

Fourth criterion in this group is toilet facility. There are 5 choices: private facility and it is located inside the house and it is ≥ 2.5 m², private facility and it is located inside the house and it is <2.5 m², private facility and it is located outside of house, public facility, and none. In this criteria also possible to chose more than one option and the average value of this choice is mapped to fuzzy set by equation (5).

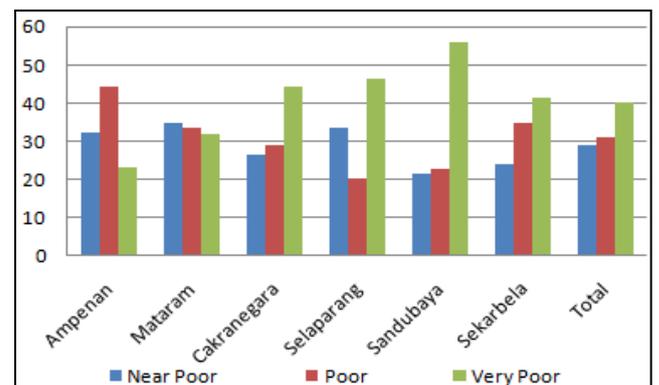


Fig.6. Percentages of Sub-districts poor household composition Based on The type toilet facility in Mataram.

Based on Fig. 6, the result of analysis presents 28.81%, 31.02%, and 40.17%, poor households are included in near poor, poor, and very poor category.

B.5. Main Light Source

Fifth criteria of this group is the main source of light that has 5 options, there are: electricity ≥ 1300 Watt, electricity ≥ 900 Watt, electricity ≤ 450 Watt, electricity that is shared by neighborhood and not electricity. The choice

can be more than one options and the average value of tis choices is mapped to fuzzy set by equation (5).

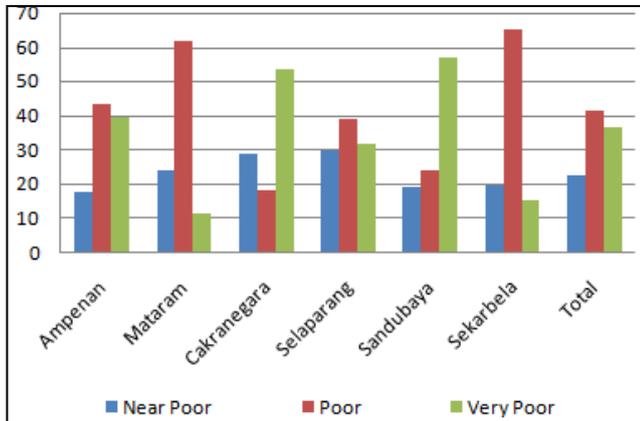


Fig. 7. Percentages of Sub-districts poor household composition Based on The source of light in Mataram.

Based on Fig. 7. It is known that 22.44%, 41.27%, and 36.29%, of poor households are included in near poor, poor, and very poor category.

C. Food Group Indicators

This indicators have questions about: daily eating frequency, weekly buying of beef/milk/chicken, drinking water facility, daily cooking energy source.

C.1. Daily Eating Frequency

The first criteria in this group is daily eating frequency that has 5 options, there are: eat as desired, more than three times per day, three times, two times, and one times per day. The choice can be combinations of those options. The average value of this combinations was mapped to fuzzy set by equation(5).

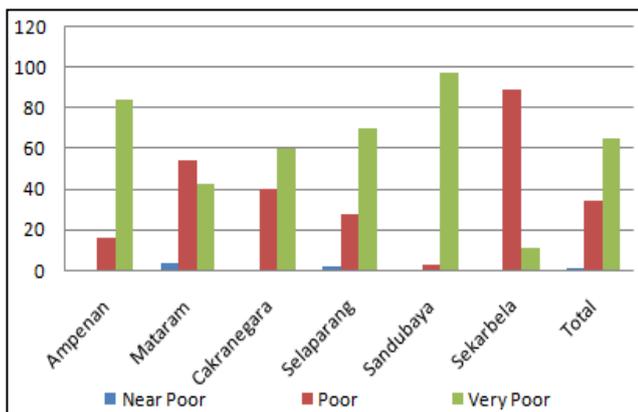


Fig. 8. Percentages of Sub-districts poor household composition Based on The Daily Eating Frequency in Mataram.

Based on Fig. 13, the result of this indicator analysis is known that 0.83%, 33.8%, and 65.37% of households in Mataram town are included in near poor, poor, and very poor category.

C.2. Weekly Consumption of Beef/Chicken/Milk

Second criteria of this group is ability of consuming beef/chicken/milkin a week that has 5 options, there are: everyday, five/sixtimes, three/four times, one/twotimes, and never. The choice can be combination of 5 options and the average value of this is mapped to fuzzy set by equation(5).

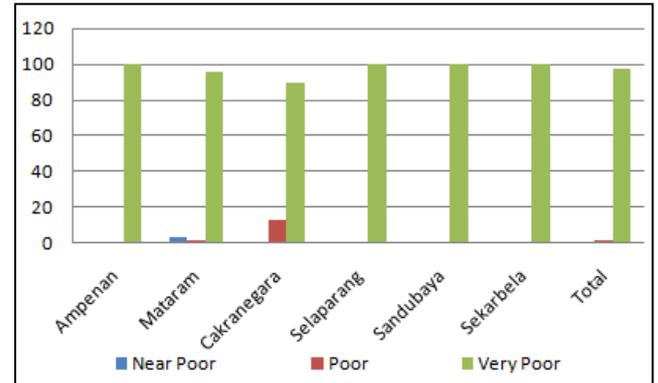


Fig. 9. Percentages of Sub-districts poor household composition Based on The Weekly Consumption of Beef/Chicken/Milk in Mataram.

Based on Fig. 9, the result of analysis in this criteria is known that 0.55%, 1.94%, dan 97.51% of households are as characteristic of near poor, poor, and very poor.

C.3. The Source of Drinking Water

The third criteria of group of food is type of drinking water source that has 5 options, there are: bottled water, water supplier company (PDAM), water pump, well, and river/unprotected spring/rain water. The choice can be combination of them and the average value that choice is mapped to fuzzy set by equation(5).

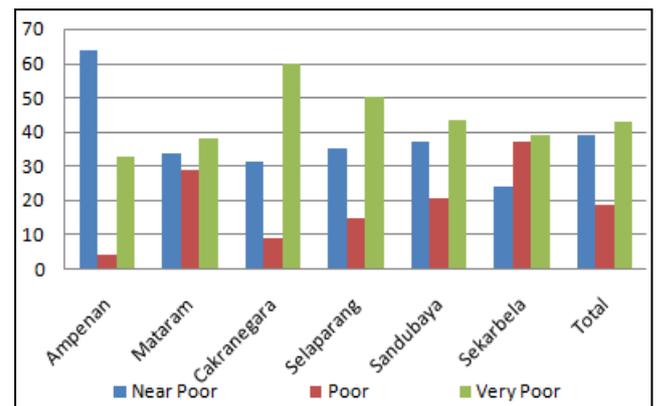


Fig. 10. Percentages of Sub-districts poor household composition Based on Drinking Water Source in Mataram.

Based on Fig. 17 and 18, it is known that 39.06%, 18.28%, and 42.66% of poor households are the characteristic of category near poor, poor, and very poor.

C.4 The Type of Energy Source for Daily Cooking

The last criteria in this group is the type of energy source of daily cooking that has 5 options, there are: electricity, gas (Liquid Petroleum Gas,LPG), biogas, stone oil, andwood/charcoal. The choice can be combination of that options and the average value of it is mapped to fuzzy set by equation (5).

Based on Fig. 11, the result of this analysis shows that 26.59%, 6.65%, and 66.76% of poor households are the characteristic of near poor, poor, and very poor category.

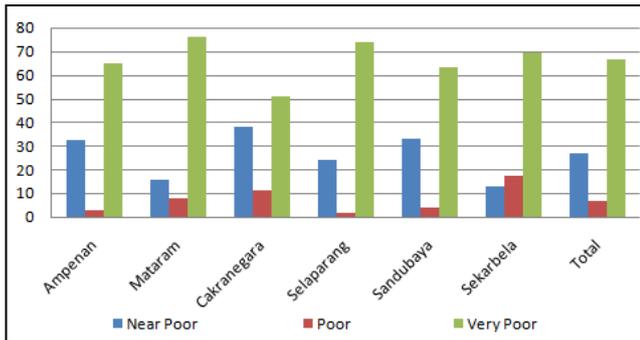


Fig. 11. Percentages of Sub-districts poor household composition Based on Energy Source of daily Cooking in Mataram.

D. Clothing Indicator Group

Indicator in this group is only one, that is the annual buying of new cloth.

D.1. Annual buying of new cloth

It has 5 options that are everytime, three cloths in a year, two cloths in a year, a cloth in a year, and never. The choice can be combination of those options and the average of thischoice is mapped to fuzzy set by equation (5).

Based on Fig.12, the result of analysis shows that 3.88%, 10.53%, and 85.6% of poor households are as characteristic of near poor, poor, and very poor category..

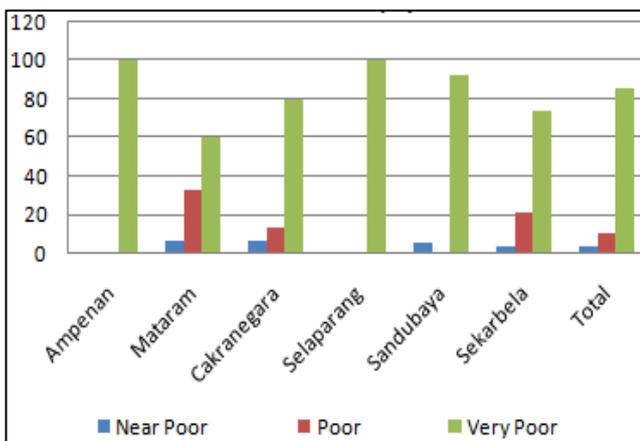


Fig. 12. Percentages of Sub-districts poor household composition Based on Annual Buying of New Cloth in Mataram.

E. Others Indicators Group

This indicators group has questions about: the ability of taking medicine, salary of household head, the heighest education of household head, and the ownership of expensive things (at least Rp. 500.000).

E.1. The Ability of taking Medicine

The first indicator in this group is the ability of household to take medicine if one of the household member is getting sick. This indicator has 5 options, there are: physician practice/private clinics, government health centers (*Pusat Kesehatan Masyarakat, PUSKESMAS*) / hospitals without public health insurance (*Jaminan Kesehatan Masyarakat, JAMKESMAS*), PUSKESMAS / hospitals with JAMKESMAS, shaman/healer, andnone. The choice can be combination of those 5 options, and the average value of this choice is mapped to fuzzy set by equation(5).

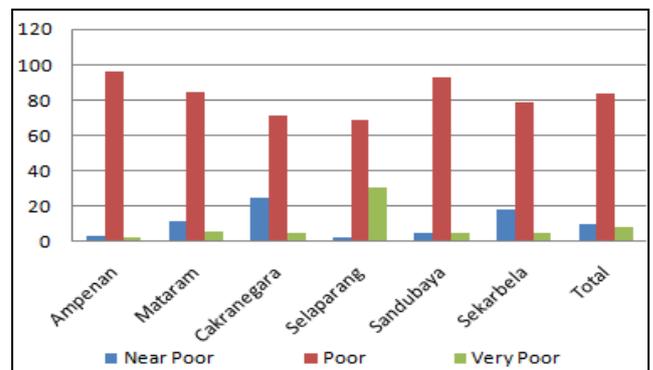


Fig. 13. Percentages of Sub-districts poor households composition Based on the ability of taking medicine in Mataram.

Base on charts in Fig.13, the result of analysis on this indicator is known that 8.86%, 83.66%, and 7.48% of poor households are categorized in near poor, poor, and very poor category.

E.2. Salary of The Household Head

The second indicator in this group is the salary of hoshold head that is qualitative attribute. The limit of poverty that has settled based on city poverty border in rupiah/capita/mounth (BPS, 2012), whereas border of wealth is determined based on regional minimum salary (*Upah Minimum Regional, UMR*). The amount of household head income is divided by the number of family member is mapped to fuzzy set by equation (3.2) for obtaining membership dgree. By this membership degree is obtained poverty degree shown in Fig. 14.

Based on Fig 14, the result of analysis shows that 1.66%, 2.22%, and 96.12% of poor households are categorized in near poor, poor, and very poor category.

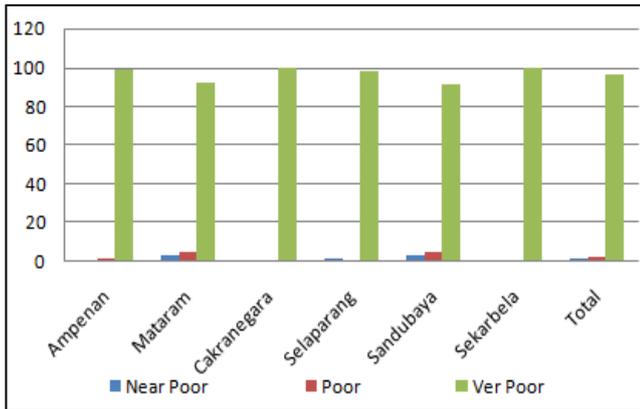


Fig. 14. Percentages of Sub-districts poor households composition Based on Salary of household head in Mataram.

E.3. The Highest Education of Household Heads

The third criteria in this group is the highest education of household head that has 5 options, there are: university graduates, senior high school graduates, junior high school graduates, elementary school graduates, and not pass elementary school /uneducated. The choice can be combination of those 5 options and the average of this choice is mapped to fuzzy set by equation(5).

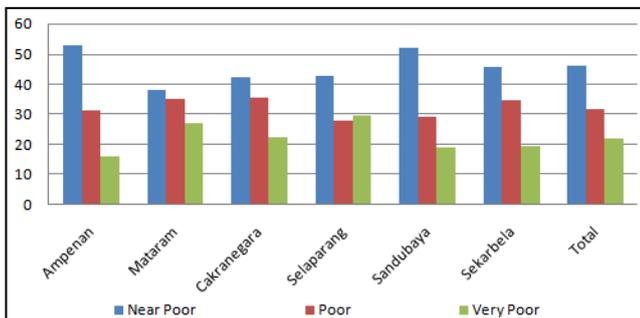


Fig. 15. Percentages of Sub-districts poor households composition Based on the Highest Education of Household Head in Mataram.

Based on Fig.15, the result of analysis in this indicator is obtained 46.26%, 31.86%, and 21.88% of households are categorized in near poor, poor, and very poor category.

E.4 Expensive Things Ownership

The last criteria of all indicators is the expensive thing ownership that is easy to sell by price Rp. 500.000 ore greater. This ownership is divided into 10 types, there are: gold saving, TV, livestock (goats/cow/horse), fowls, motor cycle, farmland, laptop, phonecell, and the others. If a household has one of these things then these household is given value by 1 and if not is given value by 0. The total of those value is mapped to fuzzy set by equation(5).

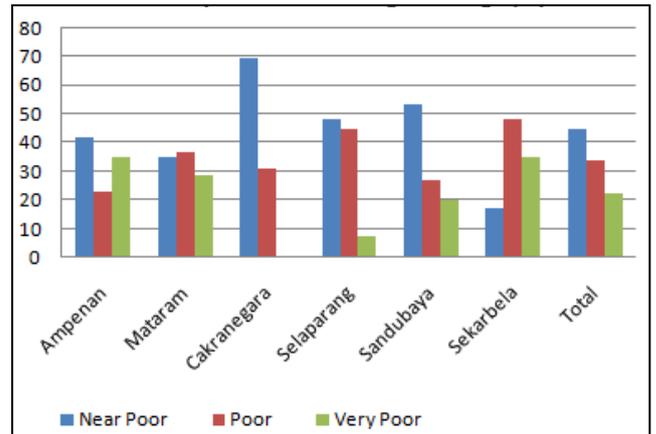


Fig. 16. Percentages of Sub-districts poor households composition Based on the Ownership of expensive things in Mataram.

Based on Fig.16, the result of analysis shows that 44,32%, 33,52%, and 22,16% of poor household are categorized in near poor, poor, and very poor category.

F. Characteristics of Poverty Degree Based on 14 Indicators

Chart in Fig. 17 presents the recapitulation of all fuzzy weigh calculations. First 5 indicators are as characteristic of very poor category, because those value is below then 0.4. These five indicators ordered from smallest are salary of household head, beef/chicken/milk consumption, annual buying of cloth, daily eating frequency, and energy source for daily cooking. And then, 8 indicators remain are as characteristics of poor category, because those fuzzy weight values are in between 0.4 to 1, there are toilet facility, main source of light, type of shelter floor, the source of drinking water, ability of taking medicine, shelter wide, ownership of expensive things, and education. Besides that, only one category is as characteristic of near poor category, these is the type of shelter wall.

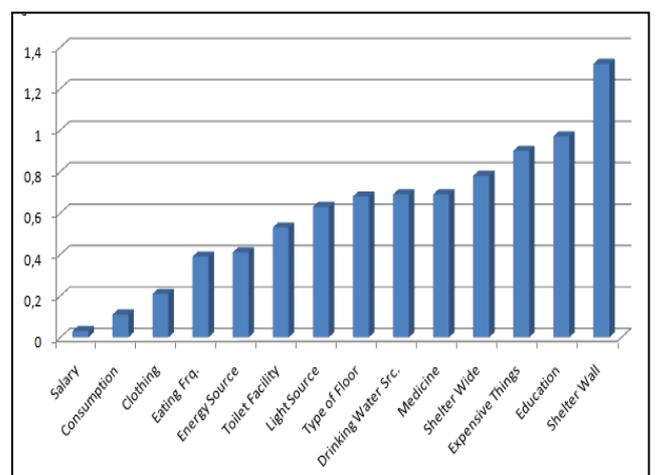


Fig. 17. Characteristics of Poverty Degree Based on 14 Indicators

G. Composition of Poor Households in Mataram

Poor households categories compositions in every subdistricts is presented in Fig. 18. The majority category in every subdistricts is poor category that has values in between a little below 90% to near 100%. Only Cakranegara has near poor category that is only in around 3%. Each subdistricts have very poor category although those are relative low to poor category that those are in below 17%. Selaparang has the highest percentage in this category and contrastly, Sekarbela has the smallest percentage.

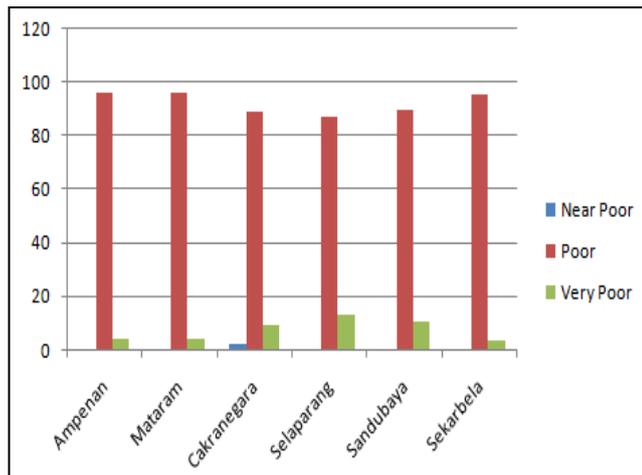


Fig.18. Poor Household Percentages in each sub districts in Mataram Town

The total amounts of poor poverty category composition in Mataram town is shown in Fig. 19. Poor category is 93.07%, very poor is 6.65%, and near poor is only 0.28% from 361 samples that had been taken.

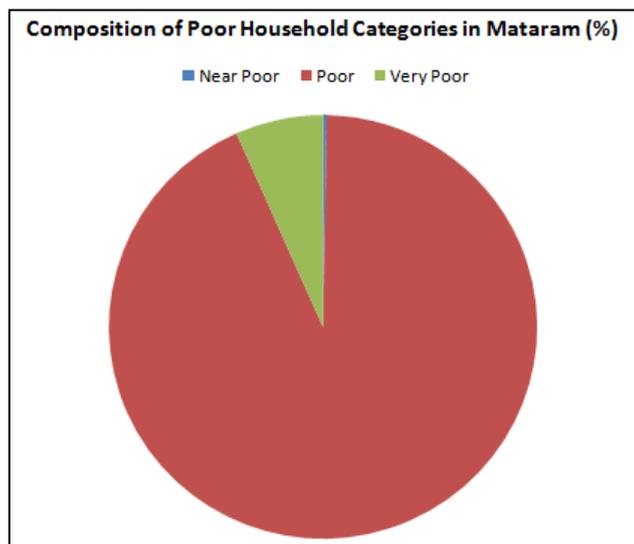


Fig.19. Poor Household Percentage in Mataram Town.

V. CONCLUSIONS

Based on the result of analysis of the application software, it can be summarized as follows:

1. There are 5 (five) criteria of poverty are indicated as characteristic of very poor category, there are: daily eating frequency, the ability of consuming beef/chicken/milk in a week, the source of energy for daily cooking, annual buying of new cloth, and the salary of household head.
2. There are 8 (eight) poverty criteria are indicated as characteristic of poor category. There are the wide of shelter building floor, the type of shelter building floor, toilet facility, main source of light, the source of drinking water, the ability of taking medicine, the highest education of the head of household, and the ownership of expensive things.
3. Only 1 (one) criterion that is indicated as characteristic of near poor category, it is the type of shelter building wall.
4. Generally, poverty category in Mataram shows that poor households in Mataram can be categorized in near poor category that has percentage is 0.28%, poor category is in 93.03% , and very poor category is in 6.65%. This composition is obtained from survey that had conducted before of 361 respondents.

VI. FUTURE WORKS

1. This research is hoped to be continued in the second year, 2014, for integrating with Geographical Information System (GIS). Therefore, this system can help Mataram Government on the mapping task of poverty in Mataram.
2. A lot of poverty degree information is presented in this application that can be used on the Decision Support System (DSS).

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