Analysis Of Indicators based Classification Of House hold poverty level In Tidore Islands

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***Abstract*— Economic growth has an important role to people's lives . Economic level of society can be judged on a variety of factors that can be used as the basis for determining the terms of grouping level of the economy such as income , education and so forth . One way to reduce poverty is to aid programs initiated by both central and local government , but there are still many aid programs are not appropriate target because there are many people capable of participating in the government's assistance . Grouping households by poverty level indicator . Where the cluster analysis method can be used as a way to differentiate objects that correspond to its characteristics .it aims to find out how many people are classified as poor (less capable) . The benefits of using these methods to speed up the processing of data and time savings . From the results of this study resulted in the interpretation of grouping households by poverty level indicator.**

Index Terms*— *cluster analysis , the poverty rate, k -Means.

I. INTRODUCTION

At the present time so many assistance programs made by pemerintah.Dimana these programs are made to reduce social inequalities in society. But in fact many aid programs are not up to the family / community disadvantaged because of lack of data on poor families, many persons responsible for the misappropriation of aid that do aid program. It required suatupenelitian for classifying poor households by these same characteristics.

Analysis grouping or cluster analysis is one of the multivariate statistical technique for classifying observations / objects that are widely used in a variety of disciplines. (Komariyah and Akbar, 2013).

The purpose of this study is a grouping of households based on indicators of poverty levels using cluster analysis method. Manfaatdari this research is the data mempermudahpencarian poor households based on indicators and time-saving process of assistance.

The concept of poverty is a problem that is associated with the ability to meet their basic needs. A household can be said to be poor if it lives in a state of deprivation that can not meet their basic needs. There are several variables that can be used as the basis for the grouping of poor households, such as building size, type of floor, wall type, facilities defecate, drinking water, source of light, the type of fuel for cooking, the frequency of buying meat, chicken and milk during the week, number of meals in a day, the number of sets of new clothes purchased during the year, access to health centers / clinics, jobs, the highest education of household head, and the ownership of assets.

Poor population according to the Central Statistics Agency (BPS) is divided into three categories, namely:

1. The population is said to be very poor if the ability to meet food consumption reached only 1900 calories per person per day plus a basic non-food needs, or equivalent to Rp. 120,000; per person per month.
2. Residents said poor if the ability to meet food consumption reached only between 1900 to 2100 calories per person per day plus a basic non-food needs, or equivalent to Rp. 150,000; per person per month.
3. Residents said the near poor if the ability to meet the food consumption only amounted to between 2100 to 2300 calories plus basic non-food needs, equivalent to Rp. 175,000; per person per month.

The analysis is a way to observe an object and then distinguish these objects correspond to each character.

II. MATERIALS AND METHODS

Location and Time Research

The study lasted for one week from 28th September to 2 October 2015 and is located in Kota Tidore Kepulauan North Maluku province.

Data Source

The data used in this research is secondary data obtained from the Office of Population and Civil Registry and the Office of National Statistics Agency Tidore Islands.

Data analysis method

Data analysis method used was K-Mean algorithm, where K-Mean is one method of non-hierarchical clustering of data that seek to partition the data into the form of one or more clusters / groups. This method of partitioning the data into clusters / groups so that the data that has the same characteristics are grouped into the same cluster. (Yudi, 2007).

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K-mean algorithm is an algorithm that takes inputsebanyak parameter k and divide a set of n objects into k clusters so that the degree of similarity between members of the cluster are high and similarities with other members of the cluster is very low. Similarities member of the cluster proximity of the object to be measured by the mean value of the cluster or can be referred to as a cluster centroid or center of mass. (Prasad, 2012).

Steps to classify algorithm K-mean that the data Determining the centroid, with the proviso that the first centroid is n the first data from the data that you want to cluster. Counting and classifying data based on characteristics. If the placement of data is the same as before, then the process is terminated. Otherwise, it will remain to be done again the classification process.

III. RESULT AND DISCUSSION

Data Rate Indicator of Poor Households

The variables / indicators used by the Central Bureau of Statistics Tidore Kepulauandalam variant analysis to determine the poor households in the city of Tidore Islands are as follows:

a. Building area; assessment of barapa meter building area is spacious buildings it owns. Values can be given untuktingkatbangunan is; (I) the value 5dengan very broad categories, (ii) the value 4dengan broad categories, (iii) nilai3 the medium category, and (iv) the value of 1 to 2 with a minor category.
b. Type floor; an assessment of the type of flooring that can be given ToKind digunakan.Nilai floor is; (I) the value of 9 with kategorilantai marble / granite, (ii) the value 8dengan categories of ceramics, (iii) the value of seven categories tapestry / parquet, and (iv) the value of 6 with a category tile / tiles, (v) the value of five categories of wood / high quality board, (vi) the value of four categories of cement / brick red, (vii) the value of three categories of bamboo, (viii) the value of two categories of wood / low quality boards, (ix) the value 1 to a category of land.
c. Type of wall; an assessment of the type of wall that can be given ToKind digunakan.Nilai wall is; (I) the value of nine categories of the wall, (ii) the value of 8 categories stucco woven bamboo / wire, (iii) the value 7 with kategorikayu, (iv) the value of six categories of woven bamboo, (v) the value of five categories of sticks, and (vi) value1 to 4 categories of bamboo.
d. Toilet facilities; The value can be assigned to level the beauty is; (I) the value of nine categories of own property, (ii) the value of 8 with common property, (iii) the value 7 to the general category, and (iv) the value of six categories of leases, (v) the value of 1 to 5 with a category does not exist.
e. Drinking water sources; that the assessment is the source of water used to satisfy that can be given untuksumber kebutuhannya.Nilai water is; (I) the value of nine categories of bottled water, (ii) the value of 8 in the category of plumbing, (iii) the value of seven categories of wells, (iv) the value of six categories of springs, (v) the value of 5 with kategoriair river / reservoir, (vi) value of 1 to 4 with rain water category.
f. Lighting sources; lighting used to illuminate the house tersebut.Nilai that can be given is untuksumber lighting; (I) the value of PLN 9 categories, (ii) the value of 8 with listr category, (iii) the value of seven categories of non PLN, and (iv) the value of 5 to 6 categories instead of electricity.
g. The type of fuel; the type of fuel used to make ends meet. Values can be given ToKind fuel is; (I) the value of 9 with kategorigas, (ii) the value 7 and 8dengan category kerosene, and (iii) the value of 4 to 6 categories of firewood.
h. Food; ie the number of eating and dining in sehari.Nilai power that can be given is; (I) the value of nine categories are fulfilled, (ii) the value of 8 categories adequately met, (iii) the value of seven categories are lacking, and (iv) the value of 4 to 6 categories are not met.
i. clothing; ie the number of sets of clothes owned by each family member. Values that can be given is; (I) the value of nine categories are fulfilled, (ii) the value of 8 categories adequately met, (iii) the value of seven categories are lacking, and (iv) the value of 4 to 6 categories are not met.
j. education; namely the level of education adopted family members. Values that can be given is; (I) the value of nine categories of undergraduate / diploma, (ii) the value of 8 with the category High School, (iii) the value of 6 to 7 with category SMP / SD, and (iv) the value of 4 to 5 by category diploma package, and (v) grades 1 to 4 to a category not completed / not in school.
k. earnings; ie the amount of income received to meet the needs hidapnya. Values that can be given is; (I) the value of 9 with the above category average, (ii) the value of 7 to 8 with the category average, (iii) the value of 5 to 6 categories below average, and (iv) the value of 1 to 4 by category no income.

The value of the poverty level indicators obtained from the calculation of the variable eleventh and then averaged. The value assigned to the indicator tingkatkemiskinan is; (I) the value of 7 to 9 with the category of near poor households, (ii)> 5 values> = 7 categories of poor households, (iii)> 1 to> = 4 categories of extremely poor households.

Table 1. Poverty rates Per Subdistrict

No	Districts	Number of Poor Families
1	Kecamatan Tidore	1.549
2	Kecamatan Tidore Selatan	1.125
3	Kecamatan Tidore Utara	1.307
4	Kacamatan Tidore	1.362

	Timur	
5	Kecamatan Oba Utara	1.574
6	Kecamatan Oba Tengah	1.545
7	Kecamatan Oba	2.185
8	Kecamatan Oba Selatan	1.185
	Total	11.832

Based on the analysis of the results obtained from the classification of the classification process using K-Mean algorithm for clustering of poor households based on indicators of poverty level. Data will be classified into 3 classes among the very poor, poor and near poor.

Specify the cluster centers randomly, c1 = (1574,8); c2 = (1362,7); dan c3 = (1125,6) Calculate indicators of each data available to any cluster centers. Calculating poor household data first to the first cluster centers are:

$$d_{(1,1)} = \sqrt{(2185-1574)^2 + (8.8-8} = 611$$

Calculating poor household data first to the second cluster centers is :

$$d_{(1,2)} = \sqrt{(2185-1362)^2 + (8.8-7)^2} = 832$$

Calculated data is of poor households first to third cluster centers are:

$$d_{(1,3)} = \sqrt{(2185-1125)^2 + (8.8-6)^2} = 1060$$

The data will be a member of a cluster that has the smallest distance from the center of his cluster. For the first data, the smallest distance is obtained in the first cluster, so that the data will first become a member of the first cluster. Likewise for the second data, the smallest distance is on the first cluster, then the data will be entered in the first cluster.

Calculate new cluster center. The first cluster, there 8kecamatan ie all districts 1, 2, 3, 4, 5, 6, 7, and indicators of the 8th, so that:

C11 = (1549 + 1125 + 1307 + 1362 + 1574 + 1545 + 2185 + 1185) / 8 = 1479

C12 = (8.8 + 6 + 7 + 6.8 + 7.8 + 7.4 + 8.5 + 6.2) / 8 = 7.31

For the second cluster, there 4kecamatan ie all districts 1, 2, 3, and 4th districts, thus:

C21 = (1549 + 1125 + 1307 + 1362) / 4 = 1335.75

C22 = (8.8 + 6 + 6.8 + 7.8) / 4 = 7.35

For the third cluster, there 4kecamatan ie all districts 5, 6, 7, and 8, so that:

C31 = (1574 + 1545 + 2185 + 1185) / 4 = 1622.25

C32 = (7.8 + 7.4 + 8.5 + 6.2) / 4 = 7.47

Repeat until the position data is not changed. Because at the 4th iteration, the iteration is stopped and the final results obtained are three clusters of the first cluster center (1479; 7.35) which can be interpreted as the group approached the poor. The second cluster center (1335.75; 7.35) which can be interpreted as being poor. The third cluster center (1622.25; 7.47) which can be interpreted as the very poor.

The author developed the algorithm K-Mean views on the lack of such algorithms, the classification process is fast but accuracy is not guaranteed. So that this method was developed by comparing each value of the data within the cluster center, when the value of the distance data is no longer changes the iteration will be terminated. Although the methods developed this classification process takes a little longer but the results are accurate compared to K-Mean algorithm

CONCLUSION

Based on the results of the analysis can be concluded that in the city of Tidore Islands are still many poor households based on indicators that have ditetapkan.Pengelompokan poor households are expected to help the government in terms of providing assistance program for poor families and reduce social inequalities in masyarakat.Saran expected their research further in analyzing the grouping of poor households so that no more errors in the distribution of aid programs. The authors hope their research further with other methods to develop indicators used

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