Forecasting Analysis Vacant Land Detection

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Abstract: Forecasting analysis is a prediction for possible a condition in the future.   The scheme or the knowledge that acquired   can be used as a reference for   policy or decision making.   The reasoning for choice the locations should have good enough knowledge.   The difficulty of determine which location's point will   be   attracted to people in the utilization of the next vacant land also being a foundation in forecasting method and forecasting analysis   used. The methods will be used are   multiple regression as   for values   using   three   variable   influential (x)   and   1 variable affected (y) to form equation value gradient and constant. Equation value gradient produced is 29.5° 92 with the constant 1 (0.006459), value constant 2 (0.0065° and value constant 3(0.0084°), so that, the prediction of the yielded become a reference to determine locations favorite ones.

Kev words: Forecasting analvsis. multiple repress ion. vacant 1ancL constant. variable. Riau

INTRODUCTION

The difficulty of determine which location's point will be attracted to people in the utilization of the next vacant land also being a foundation in forecasting method and forecasting analysis used.   The forecasting method will be used is multiple regression.   Multiple regression is one of predictive models in data mining uses which is predict a value based on value it already is.

The object of this research Pekanbaru, a city which has area 632. 26 km° consist of 12 districts with 89°.°6° population in 2010. This location will be object of research in 58 points. Where representation of this point is a small part of the region. As for variable   be used are 3 independent variables and 1 dependent variable with details X, = vacant land uses; X, = bulding land uses; X = location point enthused.

With forecasting analysis is expect to   detection land's problem can be solved, so that, the schema or the trend obtained can faciltate the public, investor and govemement to predict location point enthused.

MATERIALS AND METHODS

Theoritical
Vacant land: According to Law of Spatial Planning (UUPR) Constitution of the Republic of   Indonesia No. 24/92 about spatial planning as a whole region of human and other things and maintain their survival. And according to the basis of modern Indonesian land law

Is Law Number 5 of 1960 (UU 5/1960) also referred to as UUPA (Undang-Undang Pokok Agraria or   the Basic Agrarian Law Act) regulate   the management land include by the arrangement land uses, tenure of land arrangement, obtaining rhe right land and registration the land (Hasni, 2008).

Based to the FAO in Luthfi (200°), land have so much fuctions of them production function, environment biotic function, officers climate fuction, storage function and spasial connected function.

Multiple regression linear   methods: Regression method is one of predictive models. This method usually used to know a schema or trend in a case. And are usually can be use in forecasting analysis. This method's concept use data learning that gained in the exist data. There are several technique in this method, first linear regression and multiple regression (Beasley, 2008

There is a continuous random variable called the dependent variable,   Y and a number of independent variables, X,, X,, . ., . The purpose is to predict the value of the dependent variable (also referred to as the response variable)   using   a linear function of the independent variables (Beas ley, 2008).   The values of the independent variables(also referred to as predictor variables,   regressors or covariates) are known quantities for purposes of prediction (Zellner, 1962), the model is:

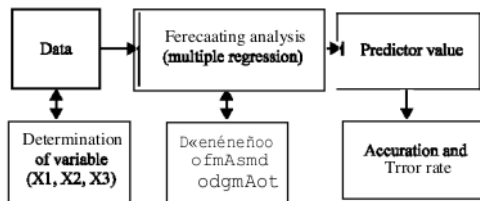$$Y = a + b_1 X_1 + b_2 X_2 +, ..., + b_n X_n \qquad (1)$$

Fig. 1: Forecasting analysis diagram

Where:

Y   The dependent variables

A   = The constant

b_1, b_2 The gradient

$X_1, {}_{2}$ The independent variebles

The formula equation formed, uses the matric with the reference explanatory variable used.

Research design: Forecasting analysis that produced to do some testing for determine the accuracy value and level of errors percentage (Culpepper, 2008). The following diagram forecasting analysis block as seen in Fig. 1.

Figure 1 explain the prediction in general. Start from preprocess ing vacant land data then processed it use multiple regression to find predictive value. Next, productive value produced to do some accuracy testing and error rates. As for variable will be used are 3 independent variables and 1 dependent variable with details X_1 = vacant land uses; X_2 = bulding land uses; X_3 = location point enthused. To find equation line preconceived previously, should find the constant and gradient value firstly. If those values have been obtained from equation, so, Y values of that equation can be displayed.

RESULTS AND DISCUSSION

As for variable will be used are 3 independent variables and 1 dependent variable with details X_1 = vacant land uses; X_2 = bulding land uses; X_3 = location point enthused which is Y = location's point enthused from 58 records processed data.

Column 1 in Table 1, explain that 3 variable X and 1 variable 1 in used. That variables have been processed use multiple regression method for obtain the equation to determine each predictor value in location point Column 4 shown the result predictor value and processed result.

Table 1: Data and prediction results

X_1	X_2	X_3	Y	Prediction results
1.05	12.600	12.60	1	29.609979830
1.51	1.580	1.58	2	29.591960340
0.64	2.000	2.00	3	29.587141180
0.37	2.300	2.30	4	29.585968730
7	53.000	53.00	5	29.725362360
9	66.000	66.00	6	29.763041960
14	145.000	145.00	7	29.945812680
7	74.000	74.00	8	29.765362490
104.28	360.230	360.23	9	30.938876970
113.34	421.650	421.65	10	31.114384620
275.75	850.240	850.24	11	32.979723960
173.69	545.300	545.30	12	31.739698170
32. 9	101. 100	101.10	13	29.984264800
921	2425.000	24.25	14	19.811623600
779	2857.000	28.57	15	16.094732670
452	1061.000	10.61	16	25.622364350
684	3751.000	37.51	17	9.687238855
3.36	5.320	5.32	18	29.611032960
35.45	12.840	12.84	19	29.832619920
16.08	12.890	12.89	20	29.707608080
16.62	17.700	17.70	21	29.720257770
3.49	5.100	5.10	22	29.611453560
0	388.000	388.00	23	30.318248030
	215.000	215.00	24	30.053311220
$	900.000	900.00	25	31.293489300
0	400.000	400.00	26	30.341105250
	209.000	209.00	27	29.977294540
	4000.000	4000.00	28	37.198270430
5	61.000	61.00	29	29.727682890
6.75	44.250	44.25	30	29.707080940
	26.000	26.00	31	29.648098400
2	22.8.0	22.80	32	29.630377290
2	23.000	23.00	33	29.635925290
2.25	28.750	28.75	34	29.648492410
" "	73.990	73.99	35	29.804160870
	115.690	115.69	36	29.833856890
34 2	114.760	114.76	37	29.818715730
24	135. 000	135.00	38	29.991353060
'	23.000	123.00	39	30.013707490
8.5	59. 500	59.50	40	29.747435170
	62. 500	62.50	41	29.733769450
22. 5	96. 500	96.50	42	29.908331280
12	85.000	85.00	43	29.818608980
1.6	59.400	59.40	44	29.702675320
1.02	53.980	53.98	45	29.688605370
1.85	91.100	91.10	46	29.764671170
2.97	36.030	36.03	47	29.667009460
1.3	37.700	37.70	48	29.659404210
1.25	42.800	42.80	49	29.668795590
1.27	42.730	42.73	50	29.668791430
269	2090.000	2090.00	51	35.297582320
286	1083. 000	1083.00	52	33.489280550
>02	907. 000	907.00	53	33.257382270
243	801.000	801.00	54	32.674407260
	40.010	40.01	55	29.655407780
	6.800	6.80	56	29.592150430
	6.600	6.60	57	29.591769480
	85.600	85.60	58	29.742246160

Figure 2 shown the process of multiple regression method and do some data reading for split data and role data. And the next step, will be gained all subsets regression (Fig. 3).
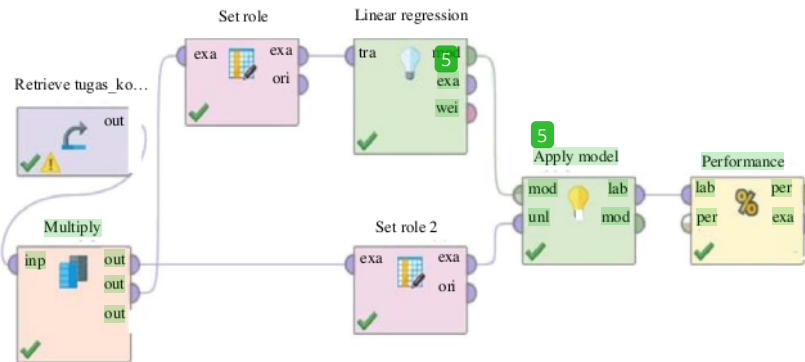
Fig. 2: Processed of multiple regression method

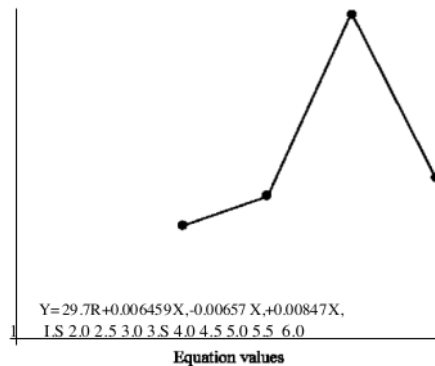$$Y = 29.7R + 0.006459X, -0.00657X, +0.00847X,$$
1.S 2.0 2.5 3.0 3.S 4.0 4.5 5.0 5.5 6.0

Equation values

Fig. 3:   equation value

Table 2: Output of StatCalc for each atribute

Coefficient	SE	Std. coefficient	Tolerance	t-stat	p-values	Code
-0.005	0.003	-0.258	0.608	-1.529	0.132	
0.0070	0.005	0.263	0.608	1.560	0.124	
29.760	2.484	-	-	11.980	0.000	.

Table 2 shown the accuracy testing for each atribute in used from linier regression produced. Next, prediction testirg for each location in aplication above with testing variable uses. Data training aplication to get prediction result of the equation had been formed. Where the equation:

$$Y = 29.579\ 2 + 0\ .0\ 06459\ X - 0.\ 00657\ X + 0.\ 0\ 0847\ X,$$

with the gradient produced is 29.5792, constant value 1 (0.006459, constant value 2 (0.00657 and coristant value 3 (0.00847). The prediction value in produced will be the trend or reference to determine the location favorite ones (Fig. 4).

CONCLUSION

Forecasting analysis is a prediction for possible a condition in the future. The scheme or the knowledge that acquired can be used as a reference for policy or decision making. The reasoning for choice the locations should have good enough knowledge.

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