CHARACTERISTICS OF LAND USE ON CLOSED DRAINAGE SYSTEM MODEL

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Abstract- This study aims for this study aimed to analyze the characteristics of the land use of the closed drainage system as prevention of flooding in the Pinrangcity. Closed drainage system modelin the Pinrangcityarea include residential areas, offices, commerce, and city parks. Changes in land use of the area did not wake become awakened region can not be blocked, increasing the number of people definitely need a means of settlement and facilities necessary support..Preventif flooding caused by the rapid development of regional areas of the city due to land conversion, causing increased surface runoff so streamflow will increase. Closed drainage models used for disposal of waste water to be reprocessed and then used. To anticipate the occurrence of floods in urban areas, land use aspects to be considered in order to formulate a sustainable drainage system.

Keynote- Land use Closed drainage system, Flood Preventing.

I. INTRODUCTION

In previous currently, the humandevelopment of highly cause termresidents in one regionbecomingnot controlled, resulting in a lack of green open space because number of settlements, Office, and industrial areas. Changing of aland use the previous system useful as the area is a rain water catchment Become an urbanized area resulting airflow is disrupted and is not their Natural Reserves soil air.
Issues related to the existing drainage system in the city Pinrang in general are as follows:

a. Happens every rain puddle down
b. Changes in land use
c. Not in accordance with the Spatial
d. Increased population growth
e. Community participation is less than optimal
f. Handling of partial drainage
g. Rain water disposal system which is still the one with the sewerage system resulted in the deposition of garbage which inhibits the flow rate of water, so frequent inundation in the channel.

Each of urban development should be followed by improvement of the drainage system. Urban drainage serves disposal of excess water to pass through a city on a ground surface (surface drainage) or below ground surface (sub-surface drainage). Urban drainage must be integrated with sanitation, garbage, flood control and other cities(Hasmar, Hasyim, 2002: 19). Good drainage system to prevent flooding in some urban areas during the rainy season and keep the groundwater reserves in the dry season.Management of excess storm water runoff that can transform it into something more useful such as water resource for the city.

Land use is a human activity on land that is directly related to the location and condition of land
(Sugiono, 2002). Changes in land use caused by urban growth and development of other sectors pose significant impact to changes in surface runoff, which affects the continued impact of the drainage system. Increasing the area awakened directly resulted in an increase coefficient of flow (C) and high rainfall intensity makes the discharge of surface runoff of rainwater is becoming increasingly large, causing flooding and the amount of land that has been covered by a layer of concrete that can not be bypassed by the flow of water and finally causing inundation.Changes in land use in urban areas, it increases the rate of runoff that occurs. Problems that occur are changes in land use in the City of productive Pinrang of paddy fields into areas such as housing and offices awakened, resulting in fewer catchment area and make the runoff be great on Pinrang City area.In particular, the changes affect flooding and inundation are likely to increase over time. The goal of this research is to analyze the characteristics of the land use of the closed drainage system in the city Pinrang.

II. THEORITICAL REVIEW

A. Land Use Characteristic

Land use is a human activity on land that is directly related to the location and condition of land
(Sugiono, 2002). Land use is an ongoing process in the use of land for construction purposes in an optimal and efficient.Land use is a form or forms of business activity to use a plot of land at one time. Land use is one of the problems of the current land use. Land use is changing the function of some or all of the land area of the original function (as planned)

into another function which becomes the negative impact (the problem) to the environment and the potential of the land itself. Land use caused by Purposes to meet the needs of a growing population numbers and increasing demands for a better quality of life.

According Kivell (1993), the quality of land is a physical constraint that is a major obstacle and limit development activity. The limited ability of the land shows that not all efforts can be supported by the land use of the land. Ability of the land to be able to support the efforts of utilization, will depend on the basic physical factors contained in the land, either in the form of environmental hydrology, geomorphology, geology, and atmosphere (Anthony J. Catanese, 1992).

B. Drainage System

Urban drainage is as a technical measure to reduce the excess water, whether from rain, seepage, or excess irrigation water from a district / land is not disturbed (Surupin, 2004).

Puddles on the road surface and the vehicle slows contributes accidents due to disruption of the view by splashes and sprays of water. If water enters the structure of the road, pavement and subgrade to be weak, and this will lead to the construction of roads is more susceptible to damage caused by traffic. Road drainage differentiated into surface drainage and drainage below the surface permukaan.Drainase intended to remove rainwater from the road surface so that traffic can drive safely and efficiently. In establishing a drainage system needs to be carefully considered conditions hidrotopografinya, the influence of tides, the location of the point of expenditure, systems existing network, land use will be planned as well as the conditions of implementation and operation of the excess water in general, both rain water, sewage or water much more flows out of the region concerned. To design a drainage must first know what kind of drainage construction is made, the following drainage under construction:

a) Open Channel

Namely the construction of the channel open at the top and in touch with the outside air. This channel is more suitable for the drainage of rain are located in areas that have a considerable extent, or drainage non - rain is not harmful to health / disturb the environment.

b) Closed Channel

Namely the construction of the channel and the channel top is closed is not related to the outside air. This channel is often used for the flow of dirty water or a channel located in the city center.

Drainage function

Drainage in the city's function as follows(Hadirhardjaja, 1997)

a) To drain the stagnant water or flooding or rainwater quickly from the road surface.

b) To prevent the flow of water coming from other regions or areas around the roads in the area of pavement.

C. Hydrological Analysis in Planning Drainage

In establishing a drainage system needs to be carefully considered hidrotopografinya conditions, the influence of tides, the location of the point of expenditure, the existing network systems, land use will be planned as well as the conditions of implementation and operation. In this case use the right method in calculating precipitation plans with a certain return period. Calculation Method used rain this plan Gumble. Debit plan Rational Mononobe calculated by the formula:

$Q = 0{,}278 \times C \times I \times A$

Where : C = Run Off Coefficient

I = Rain intensity Plan(mm/jam)

A = Catchment area (km^2)

III. RESEARCH METHOD

The research was done in Pinrang precisely in the District and Sub-District WatangSawittoPaleteang South Sulawesi Province. The analysis used is a combination of descriptive and comparative analysis.

Steps work study outline is as follows:

1. Analysis of rainfall intensity
2. Determine the flow coefficient based on changes in land use

IV. RESULT

Run Off Coefficient(c)

For the C (runoff coefficient) in this study using a runoff coefficient, C set by SNI 03-2415-1991. C value used in the calculation is as follows:

Runoff coefficient values used in the calculation

type Regions	Run Off Coefficient	Value C is used
Regional trade City Around Town	 0.70 - 0.95 0.50 - 0.70	Taken value of C = 0.80, City Pinrang including the small city category with an area 9626 hectares.
Residential Area One House Many houses, detached Many homes, meetings Settlements, suburbs Apartment	 0.30 - 0.50 0.40 - 0.60 0.60 - 0.75 0.25 - 0.40 0.50 - 0.70	Taken c = 0.50 due to a wide variety of home
Industrial Areas Light Solid	 0.50 - 0.80 0.60 - 0.90	c = 0,50
Fields, cemeteries, etc	0.10 - 0.25	c = 0,25 in consideration of changes in land use plans future
Maps, railroad, etc.	0.20 - 0.35	c = 0,35 in consideration of changes in land use plans future
Land is not maintained	0.10 - 0.30	c = 0.30 in consideration of changes in land use plans future

Surface condition	Run Off Coefficient	Nilai C yang digunakan
Pavement Asphalt and concrete	0.70 - 0.95	taken the value of c = 0.8 because not all paved roads and concrete.
Brick and concrete block	0.70 - 0.85	
Lawn, ground Sand Flat, 2%	0.05 - 0.10	c = 0,15
Average, 2 - 7%	0.10 - 0.15	
Steep, 7% or more	0.15 - 0.20	

Soil Characteristic	Land Use	(c)	Value C is used
Loam and the like	Agriculture Meadow Forest	**0.40** 0.35 0.30	For agricultural areas, namely rice field and moor taken the value of 0.4 for the type of soil in the City Pinrang composed of silt / loam and clay
Clay and the like	Agriculture Meadow Forest	**0.4** 0.35 0.30	For agricultural areas, namely rice field and moor taken the value of 0.4 for the type of soil in the City Pinrang composed of silt / loam and clay

Rainfall intensity

Average rainfall intensity - average in the period from 2008 to 2014 can be seen in the following table:

Rainfall Pinrang City2008 – 2014

Month	Year						
	2008	2009	2010	2011	2012	2013	2014
Januari	264	75	380	103	93	24	335
February	242	103	121	47	116	12	154
March	295	29	88	86	102	16	451
April	130	63	90	88	179	18	214
May	94	69	82	121	128	20	308
June	222	192	34	19	64	13	198
July	143	35	35	8	52	17	118
August	199	34	34	2	35	9	51
September	80	42	42	21	32	4	10
October	698	55	55	136	121	5	2
November	571	55	55	155	133	17	225
December	391	282	79	143	176	23	414
Annual	277,42	86,17	91,25	77,42	102,58	14,83	206,67

Analysis of Hydrology, Runoff Coefficient Jetting And Debit Surface

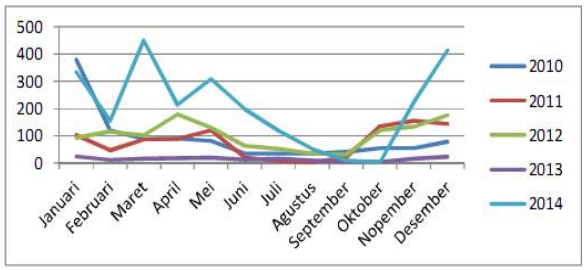
To calculate the amount of runoff that occurs in a watershed formula used rationally modified as follows:

Q = 0,00278 .Cs. C.I.A

Steps being taken to determine changes in the drainage coefficient values (c) annually to determine the coefficient of flow at each land use in a watershed and then look for the average. This will cause an increase in the coefficient of flow, thus affecting the increase in the value of surface runoff.

Cause Analysis of Flood Occurrence InPinrangcity

Still the problem of inundation due to runoff drainage in the city of Pinrang, the necessary assessment of the causes of inundation. From the calculation capacity of existing drainage channels, it is known that the drainage system in the Pinrang citystill able to accommodate discharge runoff that occurs due to local rainfall. For it is necessary to study the causes inundation of topography, geology of the study area and discharge for the City of Pinrang.



Raifall intensity2010 - 2014

CONCLUSION

From the discussion and analysis that has been done can be concluded that the change in land use will affect the surface runoff coefficient value of each variation in land use. This coefficient values tend to increase from year to year, which is caused by the phenomenon of rapid physical development in the Pinrang city. Increased undeveloped land resulting in increased surface runoff coefficient This will lead to an increase in the coefficient of flow, thus affecting the increase in the value of surface runoff.

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