Study Of The Maximum Flood Discharge Capacity At The Sub Watershed Karang Mumus And Karang Asam In Samarinda City

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Abstract: Biophysical conditions Karang Mumus Sub Watershed, Big Karang Asam and Small Karang Asam affect the characteristics of the flow hydrograph is important to note is the volume of water flow, flood discharge and the time until the maximum flood discharge. The shape of the Watershed slope geology and land cover types of soil are the physical characteristics that will affect the magnitude of the increase in the flow of surface water in response to rainfall. Changes in biophysical factors have a real impact on the volume of surface water flow increase, the maximum flood discharge, rainfall intensity and time. Predicting areas prone to flooding based on topographic maps and extensive inundation maps. The purpose of this study to determine the biophysical conditions and predict areas prone to flooding in the Sub Watershed and Sub Watershed Karang Mumus of the Big Karang Asam , and Small Karang Asam. Research methods to identify the biophysical conditions Karang Mumus , Big Karang Asam , and Small Karang Asam Sub Watershed and predicted a flood prone area in the Karang Mumus, Big Karang Asam and Small Karang Asam Sub Watershed. Results are expected to know the condition of the biophysical Karang Mumus, of the Big Karang Asam , and Small Karang Asam Sub Watershed and can be known capacities of river water, thus increasing the benefit / optimization function River. Conclusion Sub Watershed as a fan shape effect on the main River flood flow pattern is relatively large peak flow rate with the flood trip tributaries which simultaneously causes erosion and sedimentation in the estuary with the original host rock lithology form claystone, shale and sandstone smooth as well as the presence of land cover in the form of shrubs in the upper dense settlements downstream with stilt houses that impede the flow of water causing floods last longer. And flooding that occurred in the City of Samarinda during the rainy season the upstream Watershed with a steep slope conditions on topographic maps and extensive inundation maps that have the potential for very prone to flooding and inundation occurred in the subdistrict of the potential for very prone to flooding and inundation occurred in the subdistrict of North Samarinda.

Index Terms: biophysical conditions, flood prone area.

I. INTRODUCTION

FLOODING occurs when heavy rain with relatively high rainfall intensity. River channel capacities, and existing water storage area in the City of Samarinda is no longer able to accommodate the runoff of rainwater flooding also caused by runoff water from the Mahakam River during high water conditions in the downstream area of the City of Samarinda. Rivers were accommodating and channeling rain water from areas of high to a lower area, in the water flow materials transported sediment carried by the flow of River water which causes silting due to sedimentation. Flooding in areas along the Watershed Karang Mumus, Watershed Karang Asam influenced by surface water runoff is relatively large and the rate of eroded soil as sediment on the River from the catchment area in the Watershed area. Biophysical conditions greatly affect the occurrence of flooding and waterlogging of land use patterns that one allotment area and the change of land use from catchments into flood areas if heavy rainfall may increase the rate of surface water runoff and sedimentation. In the rainy season the River drainage area and Karang Mumus, Karang Asam frequent flooding River channel can not accommodate floodwater perfectly. Circumstances River winding and narrow downstream resulting in flooding and during the rainy season and the River drainage area Karang Mumus frequent flooding of the River flow is not able to accommodate floodwater overflow.

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The purpose of this study to determine the biophysical conditions and predict areas prone to flooding in the Sub Watershed Karang Mumus of the Big Karang Asam , and Sub Watershed Small Karang Asam Results are expected to know the condition of the biophysical Sub Watershed Karang Mumus, Sub Watershed of the Big Karang Asam , and Sub Watershed Small Karang Asam and can be known capacities of River water, thus increasing the benefit / optimization function River.

2 RESEARCH METHODS

Location and Time Researc Karang Mumus research Sub Watershed , research materials and equipment used in this study include:

1. Map of the Watershed, geological maps, maps of soil type, land cover maps, River network maps and topographic maps and extensive inundation maps Watershed Karang Mumus Watershed and the Big Karang Asam and Watershed Small Karang Asam;
2. The digital camera is used to research and document activities;
3. Computers, laptops, and printers used for data compilation, processing and analysis of data and preparation of research reports, writing equipment.

3 RESEARCH PROCEDURES

The study procedures were performed in this study as follows:

1. Identify the biophysical conditions Karang Mumus Sub Watershed, Sub Watershed Big Karang Asam and Small Karang Asam Sub Watershed;
2. Predicting the flood-prone area in the Karang Mumus Sub Watershed, of the Big Karang Asam and Sub watershed Small Karang Asam.

4 DATA COLLECTION

The data collected in this study as follows:

1. Collection and inventory related data necessary to identify the biophysical conditions and areas prone to flooding Sub Watershed Karang Mumus , Sub Watershed of the Big Karang Asam , and Sub Watershed Small Karang Asam;
2. Collection of relevant supporting data, topographic maps, flood vulnerability maps, the area inundation maps, land cover maps, geological maps, soil type maps, maps and River networks rainfall data.

5 DATA ANALYSIS

Biophysical analysis Karang Mumus Sub Watershed, Sub Watershed of the Big Karang Asam and Sub Watershed Small Karang Asam: Watershed shape, topography / slope, vast pool of geology, soil type, land closures . Analysis of flood prone areas: Karang Mumus Sub Watershed , Sub Watershed of the Big Karang Asam and Sub Watershed Small Karang Asam

6 RESULTS AND DISCUSSION

CONDITIONS BIOPHYSICAL KARANG MUMUS SUB WATERSHED BIG KARANG ASAM OF AND SUB WATERSHED SMALL KARANG ASAM**.** Analysis of the relationship of rainfall and flooding for Watershed can be learned through the study of the characteristics of the flow hydrograph Watershed and connect with the factors that affect the characteristics of the hydrograph. Flow hydrograph characteristics important to note is the volume of water flow, flood discharge and the time until the maximum flood discharge. Watershed shape, slope, extensive inundation, geology, soil type and land cover are physical characteristics that will affect the magnitude of the increase in the flow of surface water in response to rainfall. Changes in biophysical factors will have a real impact on the volume of surface water flow increase, the maximum flood discharge, rainfall intensity and time.

6.1 Shape watershed

Form of Watershed is a blend form a fan shape in the upstream and downstream elongated shape. With the flood peak discharge fan shape is relatively large with a trip flooding of the tributaries of different time.

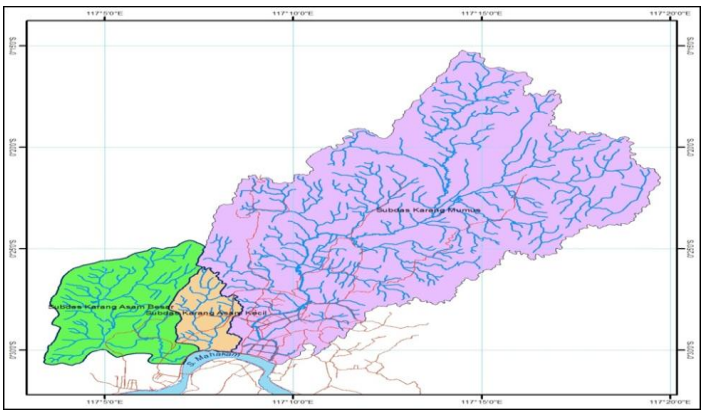

Figure 1. *Map of Karang Mumus Sub Watershed, Sub Watershed of the Big Karang Asam and Sub Watershed Small Karang Asam*

6.2 Geology

Geological formation in relation to the parent rock material contained in Sub Watershed porous rock types such as limestone or limestone will produce a discharge hydrograph peak flow with a low and relatively longer time concentration. Balikpapan Formation geological formations, sandstone and clay interlude with easily separated. Pulaubalang Formation, quartz sandstones with inserts limestone, clay stone, coal, quartz sandstones, reddish gray. Great Watershed Acid dominated Balikpapan Formation and Sub Watershed Small Karang Asam Formation dominated Pulaubalang. From a geological formation influence the fraction of sediment grains into the river which is a delicate material precipitated to sedimentation very influential at the inserts silt, shale limestone and coal. quartz sandstone, yellowish white, calcareous sandstones inserted coal seams, Bebuluh Formation, limestone with sandy limestones and shales inserts, solid gray color. Dangkan Sandstone, sandstone rocks Dangkan an integral sequence is composed of calcareous mudstone, siltstone and fine sandstone. Kampungbaru Formation, quartz sandstones with inserts clay, shale, silt and inserts soft friable sandstone with quartz components, red clay flakes time of the flood discharge capacity of the river rose so Watershed is reduced because there is not that secure the flow of water into a large surface and erosion which resulting sedimentation in the River so that the capacity of the River to be down due to land use changes occur that result in the erosion of sediment into the River so that the capacity of the River is reduced.

6.3 Soil type

Alluvial soil type soil from erosion proceeds deposited in the lowlands, Alluvial soil fertile soil properties, soil Alluvial a young soil deposition of fine material results River flow, this land is suitable for growing rice, sugar cane, coconut, tobacco and fruits. Alluvial soil formation process depends on the origin of the soil parent material and topography, have a fertility rate which varies from low to high, the texture of medium to coarse, and organic matter content from low to high. Red yellow Podzolic soil type is soil formed because of high rainfall and low temperatures, nutrient poor, infertile, this land is good for coconut and cashew and unfavorable for agriculture. Red yellow Podzolic soil levels of permeability, infiltration moderate to slow, the surface layer further down more slowly, the soil has poor chemical properties while the physical properties are not steady with soil aggregate stability consequently less susceptible to erosion due to motion water.Ground the Sub Watershed Karang Mumus, Sub Watershed Big Karang Asam and Small Karang Asam Sub Watershed consists of Alluvial soil and red yellow Podzolic. Alluvial soil types are mostly found in the stream along the River that has a slope of less than 8%, and is the result of fine material from the River sediment that is easy to absorb high power water infiltration. Red yellow Podzolic soil covers an area largely slope above 8%, Podzolic soil derived from quartz sandstone with clay to sandy texture, so has the nature of power rather difficult to absorb water infiltration is low, resulting into the water to overflow area slope <8% in case of rain which caused flooding and inundation prone.

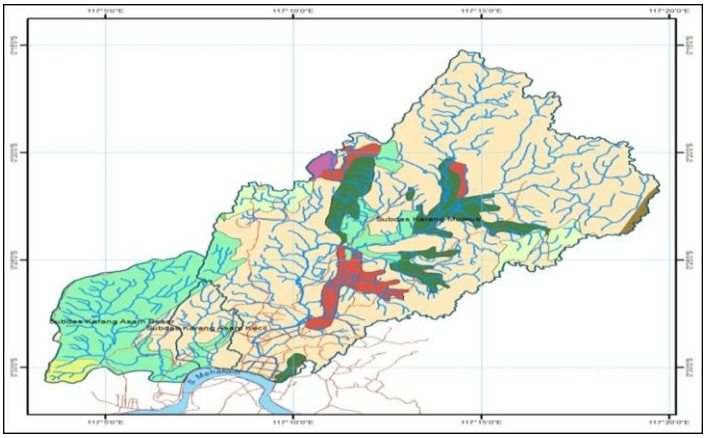

Figure 2. *Soil Type Map Karang Mumus Sub Watershed, Sub Watershed of the Big Karang Asam and Sub Watershed Small Karang Asam*

6.4 Closure/land use

In the land cover / land use affects the rising flood discharge because no one Watershed hold the flow of water into a large surface erosion and resulting sedimentation in the River so that the capacity of the River to be down. Due to changes in land use resulting erosion sediment into the the form of shrubs in the upstream and downstream of a dense residential area. This densely settled mostly located on the banks of the river in the form of houses on stilts, which can impede the flow of the river. Forest area has lost much turned into fields and unproductive. Land cover / land use in River so that the capacity of the River is reduced. River flow capacity reduction may be caused by precipitation from sedimentation in the river due to the absence of vegetation cover and the presence of improper land use. Land cover in Karang Mumus Sub Watershed, Sub Watershed of the Big Karang Asam and Sub Watershed Small Karang Asam in the Sub Watershed Karang Mumus, Sub Watershed Big Karang Asam and Small Karang Asam in the form of forest, garden mix, oil palm plantations, open land, settlement, mining, agriculture, wetlands, dry land farming, marsh, scrub . Land use affects the determination of areas prone to flooding, land use related to the size of runoff water.

6.5 Flood prone areas

Karang Mumus Sub Watershed , Sub Watershed of the Big Karang Asam and Sub Watershed Small Karang Asam the slope is a huge factor influence on the level of vulnerability to flooding. Based on topographic maps and extensive inundation maps that have the potential prone to flooding and inundation occurs in 0-8% slope with a flat slope grade and slope grade 8-15% with a gentle slope classes in the subdistrict of Ilir, Samarinda City, Samarinda Ulu, Samarinda North, Speech, Sungai Pinang, River class Kunjang runoff water. flat slopes and ramps that lead to the inundation and flooding. On the topographic map 15-25% slope class rather steep slope and slope steep slopes of 25-40% grade in the area of Samarinda Ilir, Samarinda Ulu, North Samarinda, Speech, Pinang River, Kunjang River which resulted in flooding and erosion on River flow. flooding is a situation where the River water flow can not be accommodated by the River trough, as the flood discharge is greater than the capacity of the existing River. Predicting areas prone to flooding by extensive inundation maps and topographic maps.

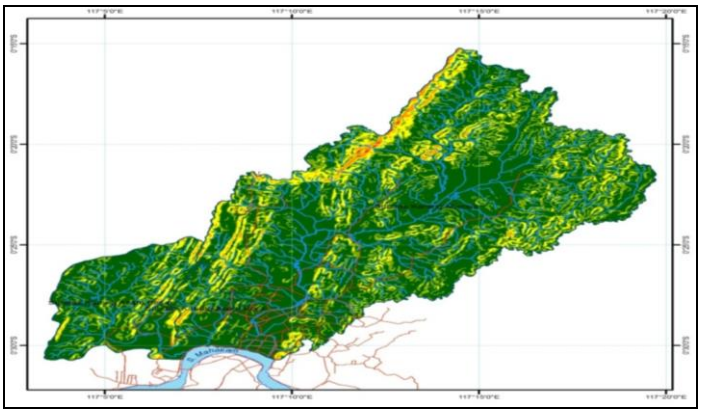

Figure 3. Topographic Map Karang Mumus Sub Watershed, Sub Watershed Big Karang Asam and Sub Watershed Small Karang Asam

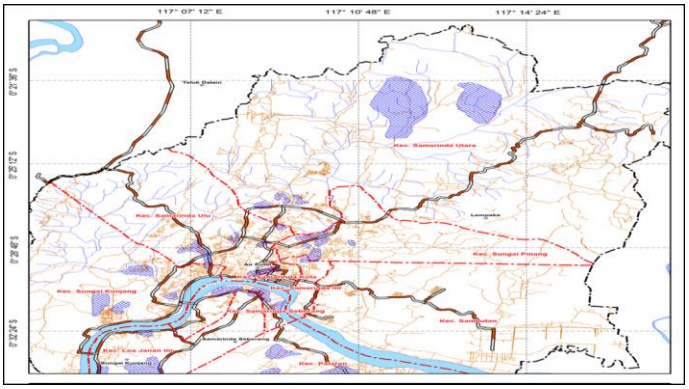

Figure 4. *Regional Map Karang Mumus Puddle Sub Watershed, Sub Watershed of the Big Karang Asam and Sub Watershed Small Karang Asam*

7 Conclusions and Suggestions

7.1 Conclusion

1. Form Sub Watershed as fan effect on the main River flood flow pattern is relatively large peak flow rate with the flood trip tributaries which simultaneously causes erosion and sedimentation in the estuary with the original host rock lithology form claystone, shale and sandstone smooth and with the land cover in the form of shrubs in the upper dense settlements in the lower reaches of the houses on stilts that impede the flow of water causing floods last longer.
2. Floods that occurred in the City of Samarinda during the rainy season the upstream Watershed with a steep slope conditions on topographic maps and extensive inundation maps that have the potential for very prone to flooding and inundation occurred in the subdistrict of North Samarinda.

7.2 Advice

1. Conservation of vegetative land is very beneficial and environmentally friendly, planting grass for the preservation of land and water by covering the surface of the soil with grass plant species prevents erosion of land with a slope of less than 15%, the use of space for activities beyond land use should be reviewed, policing and law enforcement must be implemented in order to

maintain the balance of the environment, shall be published on legislation and regulation of the Minister of settings River riparian zones, but the implementation in the field are still many obstacles related to the culture and characteristics of the area that needs to be curbed local regulations.

2. The work of conservation and flood control activities can be done by performing normalization by improving dimensions River bottom slope repair and retrofitting of the cliff to set up a River bank.

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