

THE STUDY OF CRITICAL LAND MAPPING AT THE SUB-DAS KALI GUNTING OF JOMBANG REGENCY

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ABSTRACT

Sub-DAS Kali Gunting was characterized by land-uses dominated by forest and plantation at upstream with human settlement at downstream. The slope of the upstream was very steep. The change of land-use eroded the infiltrative capacity of the soil, and therefore, river water debit was becoming excess. Pursuant to this condition, the study attempted to review the danger rate of erosion against the existing land condition in 2014, and also to examine whether land-use was directed based on the class of land capacity at Sub-DAS Kali Gunting.

Method to calculate erosion rate was MUSLE. This method used the approach of surface overflow. The involved data were 10-year rainfall, land-use, soil type, column depth map, slope, and soil texture soil. Data were processed by Geographic Information System (GIS).

Result of study showed that erosion rate at Sub-DAS Kali Gunting was 2,564.28 tons/ha/year. It means that Sub-DAS Kali Gunting has lost its soil level for 16.03 mm/year. Land criticality rate at Sub-DAS Kali Gunting can be arranged as following: 19,228.05 ha (58.9%) were very critical; 9,787.93 ha (30.0%) were critical; 3,560.11 (10.9%) were semi critical; and 54.80 ha (0.2%) were potentially critical. Sub-DAS Kali Gunting was divided into 4 area functions. The area allotted for annual plant cultivation was 21,704.3 ha (66.51%); that for protected area was 2,848.4 ha (8.73%); that for supporting area was 4,943.14 ha (15.15%); and that for seasonal plant cultivation was 3,135.06 ha (9.61%). The composition of land-use at Sub-DAS Kali Gunting had been compatible to the area function, precisely for the protected forest at width of 2,848.4 ha. The supporting area comprised of the mixed forest at width of 304.49 ha, the production forest at width of 58.992 ha, the limited production forest at width of 1,942.26 ha, the human settlement at width of 135.232 ha, the irrigated field at width of 24,813 ha, and the rain-cistern field at width of 30.246 ha. Seasonal plant cultivation area was used for the limited production forest at width of 36.296 ha, the people forest at width of 53.054 ha, the human settlement at width of 656.501 ha, the plantation at width of 244.96 ha, the irrigated field at width of 1,569.30 ha, the bushes at width of 53.37, and the non-irrigated field at width of 125.96 ha. The annual plant cultivation area consisted of the mixed forest at width of 421.68 ha, the production forest at width of 1,862.071 ha, the limited production forest at width of 492.499 ha, the people forest at width of 3,127.137 ha, the human settlement at width of 2,972.95 ha, the plantation at width of 3,081.98 ha, the irrigated field at width of 5,971.78 ha, the rain-cistern field at width of 947.42 ha, the bushes at width of 17.99 ha, and the non-irrigated field at width of 70.21 ha.

Keywords: Erosion, Land Criticality, Land Capacity, Area Functional Direction, Land-Use Order