

CIKAPUNDUNG UPSTREAM WATERSHED MORPHOMETRICAL CHARACTERISTICS, BANDUNG REGENCY, WEST JAVA

Agung MULYO¹, Aldo PRAYOGA¹, Rai IKHSAN¹, NEMAN¹, Agus Didit HARYANTO¹, Nana SULAKSANA¹

¹Faculty of Geological Engineering, Universitas Padjadjaran, Indonesia

Corresponding Author: agung.mulyo@unpad.ac.id

Abstract

Upstream watershed of Cikapundung or commonly known as **Lembang Basin** is located in Bandung Regency, West Java. It's relatively extended to West – East direction, parallel to Lembang Fault which is the watershed border in the southern side. Cikapundung watershed is bounded to the west side by Tangkuban Perahu Mountain (2,076 m) and Pasir Ipis. In the northern side to the eastern side there are Lingkung Mountain, Cikandung Mountain, Cikoneng Mountain, Tunggul Hill (2,209 m), Sanggara Mountain, and Pangparang Mountain (1,953 m). The southern border is a cliff with an orientation of west – east. The cliff was formed because of foot wall which is lifted from the Lembang Fault. Hill Peaks that are located along the fault line is Pasir Malang, Pasir Pangukusan, and Pulasari Mountain.

Generally, there are five rock units (Late Pleistocene – Holocene). Volcanic breccia unit (Cikapundung Formation), old volcanic sediment unit, tuff – pumice unit (Cibereum Formation), tuff – sandstone unit (Cikidang Formation), and colluvium. Normal fault of Lembang with west – east orientation is the main geological structure which becomes groundwater flow barrier from the upstream of Cikapundung watershed to Bandung Basin below it. The land use varies from rural areas in the form of farming area to real estate areas.

Cikapundung watershed is 80,475 km², its circumference is 51,575 km, and $R_c = 0.380$. The river can be classified into six orders, 1st-order stream = 449 rivers, 2nd-order stream = 89 rivers, 3rd-order stream = 23 rivers, 4th-order stream = seven rivers, 5th-order stream = 3 rivers, and 6th-order stream = one river. Because of its big difference, R_b value of the 1st to 2nd-order stream becomes bigger, which is 5.04. However, there's also a small R_b value between the 4th-5th order stream which is 2.33. because of that, it can be clearly inferred that the Lembang Fault controls morphometry of the research area.

Generally, elevation of upstream and downstream is inversely proportional with the stream order. Difference between elevation of upstream and the elevation of downstream in each order is relatively same. Wide average of basin is consistently proportional with the stream order. Meanwhile, it's inversely proportional with the river frequency (F). The K_c and R_c is far below 1 which means the river hidrograf doesn't have a pointy peak.

Keywords: Morphometry, Upstream, Cikapundung rivers