

FLOOD-PLAIN UTILIZATION IN SOME BEDADUNG'S SUB-WATERSHED FOR PADDY CULTIVATION IN ORDER TO SUPPORT FOOD SECURITY

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Abstract

Along with the rapid growth of population on Java island, many land-uses were change as residential and agricultural-field. One consequence of these conditions was the increased sensitivity of the environment against climate change like floods in the rainy season and drought in the dry season. The purpose of study were identifying the floodplain area in several sub-watershed in Bedadung's watershed due to utilization of paddy cultivation as an alternative to use of marginal land to reduce the rate of catchment deforestation. The research was conducted in several sub-watershed that are part of the Bedadung watershed i.e : Kaliputih, Dinoyo and Kaliwates. Soil characteristics and climatic data were collected from Bappeda Jember, BP-DAS and BMKG. Sub-watershed boundary was identified using Indonesia's Earth Map scale 1: 50,000, while the floodplains, land uses and slope based identified by satellite imagery. Image analysis performed by open source GIS software, and the risk of crop failure analysis obtained from the data overlay cropping patterns and the incidence of flooding during the last 20 years. The results showed that the the largest floodplain that can be utilized for paddy cultivation expansion was in Kaliputih (48.02%), whereas the highest production level achieved by the Dinoyo and Kaliputih (70 tons) and the highest level of productivity achieved by the Kaliwates and Dinoyo (4 ton.ha⁻¹). Level of risk of crop failure due to environmental sensitivity in each sub-watershed was 67% for Kaliputih, 48% for Kaliwates and a 35% for Dinoyo.

Keywords : *Watershed, sub-watershed, floods, floodplain, and deforestation.*

Introduction

Bedadung's watershed is a watershed that is in the south and east of the Argopuro's Mountains. The old of geological age brought consequences to the high levels of weathering on the surface and sub-surface area. Generally, areas in the south Argopuro have a high rainfall that has range between 3000 - 5000 mm per year. High rainfall inevitably increases the risk of flash floods and landslides in the area. Data on the incidence of debris flows and landslides from Kesbanglinmas Office of Jember Regency was indicate high quantity at 35-52 events each year and peaked in 2006 when 70% area of Kaliputih sub-watershed was eroded. The incident has killed as many as 119 people, injured hundreds of people, 7.605 people has to evacuated. Damages and material losses was about 60 billion rupiah (Hermiyanto et al, 2010).

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