

# Riparian plant diversity in relation to artisanal mining sites in Cikidang River, Banten, Indonesia

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**Abstract.** *Takarina ND, Sinaga IL, Kultsum TR. 2021. Riparian plant diversity in relation to artisanal mining sites in Cikidang River, Banten, Indonesia. Biodiversitas 22: 401-407.* Artisanal mining usually occurs in gold mining activities near the river banks and consequently, this will affect the downstream ecosystem include riparian habitat and its plant diversity. Here, this study aimed to assess the effects of artisanal mining sites on the riparian plant diversity in Cikidang River, Lebak District, Banten Province, Indonesia. The study was conducted by placing 10 sampling stations along 4 km of Cikidang River with width of 20 m. Riparian plant species were collected and identified from 10 m x 10 m sampling plots in each station. Plant diversity was assessed using Shannon-Wiener, Simpson, Margalef, and Pielou indices. There were in total 18 families and 42 plant species have been identified. Compositae and Poaceae were plant families that common here. *Ageratum conyzoides* was the most common species followed by *Impatiens platypetala*, *Cibadium surinamense*, *Wollastonia biflora*, *Calliandra calothyrsus*, and *Pityrogramma calomelanos*. Shannon-Wiener diversity index was in the range of 1.040-1.561. There was a positive correlation between riparian diversity with the distance to mining sites with decreasing diversity trends toward artisanal mining sites. Riparian habitats located far (> 1 km) from the mining sites have more species. While species observed in riparian habitats near (0.3-1 km) the mining sites were accounted only for 26.1% of total species found. To conclude, the presence of artisanal mining sites can affect the nearby riparian plant diversity.

**Keywords:** Artisanal, diversity, plant, mining, riparian

## INTRODUCTION

Mining activities were known to have effects on ecosystem and biodiversity at multiple spatial scales included site, landscape, regional and global (Sonter et al. 2018). Those effects have resulted from direct activities like mineral extraction and indirect processes included industries supporting mining operations. Impacts on biodiversity have occurred across landscapes and regions. Mining activities in Madre de Dios in Peru have exported contaminated sediments to rivers in Brazil (Asner et al. 2013) and leave only tolerant species behind (Li et al. 2010). Iron mining has removed exceptionally diverse plant communities entirely as observed in Brazil (Jacobi et al. 2011). Mining impacts on biodiversity have emerged through indirect/secondary and cumulative pathways at landscape and region-wide scales (Raiter et al. 2014). Indirect impacts happen when mining increases additional biodiversity loss through mining associated infrastructure development. This development can attract human populations causing new threats (Sonter et al. 2017) or even exacerbate existing threats including over-exploitation, hunting, fishing, invasive species presence and habitat loss for other anthropogenic-related land uses (Alamgir et al. 2017, Fatah 2008.).

Different mining methods pose different threats to biodiversity. One of mining methods is known as artisanal mining. Impacts of artisanal mining on ecosystem and biodiversity have been reported in many literature. In Ethiopia, artisanal mining has removed significant volumes

of soil, destroyed massive tracts of vegetation, and have exposed dead trees and tree roots. Artisanal mining system has converted vegetated sites into dysfunctional landscape (Meaza et al. 2017) and degraded indigenous plant diversity (Girmay 2018). Artisanal mining activities were located near the river banks since the mines need water to process and discharge waste. This condition has caused environmental degradation on riparian habitat nearby with observed impacts included diversion and sedimentation of some rivers (Funoh 2014). In Pungwe river basin, the artisanal mining activities cause erosion and export large amount of sediment feeding the Pungwe river system make the water for domestic use and irrigation becomes unfit due to the suspended sediment (Pereira 2009). In Surow river, the main effects of the artisanal mining activities on river systems including changes in water conductivity, sediment loads and river morphology alterations (Macdonald et al. 2015). While in Cikotok mining, Banten, artisanal mining has released Pb and Zn to the environment (Latifundia 2015).

Riparian habitats were known for having plant diversity and this ecosystem was also affected by nearby artisanal mining activities. Despite there are numerous studies that reported effects of artisanal mining effects on riparian habitats, whereas the artisanal mining effects for particular riparian plant diversity have received little attention in the literature. One of the river systems that has experienced artisanal mining activities is Cikidang River in Banten Province. Kurniawan et al (2013) have recorded that mining in Lebak, Banten have occupied an area of 6445