

Groundwater and reservoirs interaction in its use for irrigation, Case study: Wajo Regency, South Sulawesi Province, Indonesia

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Abstract. The use of groundwater for irrigation in the Wajo Regency has been going on since the 2000s. The use of groundwater has the potential to cause high production costs, which can reduce farmers' income. The Government of Wajo Regency provided a solution to this problem through the reservoir development program. However, the impact of the construction of reservoirs on environmental conservation is not yet known. Therefore, it is necessary to conduct research that aims to determine reservoirs' effect to fulfill plant water needs and their impact on the environment. The study was conducted by direct measurement in the field of the observed variables. Some data are obtained in real-time using sensors such as rainfall, groundwater level changes, surface water level, and evaporation data. Data were analyzed using the water balance approach. The results showed that the construction of reservoirs to meet the water needs of plants could reduce the radius of the influence of groundwater extraction for irrigation which has so far reached 50-100 m, as well as reducing the decrease in groundwater level during pumping, which originally reached more than 5 m. The reservoir can increase the groundwater level as indicated by the increase that occurs when the surface water level increases.

1. Introduction

The use of groundwater for irrigation in the Wajo Regency has been going on since the 2000s. The use of groundwater has the potential to cause environmental damage, such as declining groundwater levels [1]. If this condition occurs for a long time, it can cause land subsidence [2], seawater intrusion [3], and the economic impact is that farmers suffer losses due to high costs. The negative effect is even



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