

ABSTRAK

Penelitian ini dilakukan untuk merencanakan pembangunan embung sebagai penyedia air irigasi di Desa Banjarsari, Kecamatan Ajibarang, Kabupaten Banyumas. Daerah ini memiliki potensi pertanian yang luas, yaitu sekitar 84 hektar, namun sering mengalami kekurangan air pada musim kemarau. Pembangunan embung diharapkan dapat menjadi solusi penyimpanan air yang efektif dalam menunjang ketersediaan air bagi lahan pertanian, serta mengoptimalkan pemanfaatan air hujan dan aliran permukaan. Tujuan dari penelitian ini adalah untuk mengetahui kapasitas tampungan embung, neraca air tahunan, serta estimasi biaya pembangunan embung yang sesuai dengan kondisi daerah penelitian.

Metode penelitian dilakukan dengan mengumpulkan data primer dan sekunder, meliputi data curah hujan, data klimatologi, data debit andalan (Q_{80}), serta data kebutuhan air irigasi. Analisis curah hujan dilakukan untuk menentukan curah hujan rencana dan distribusinya, sedangkan debit andalan dihitung berdasarkan data debit sungai yang digunakan untuk suplai embung. Perhitungan kebutuhan air irigasi menggunakan metode neraca air dengan mempertimbangkan evapotranspirasi, curah hujan efektif, efisiensi irigasi, dan pola tanam petani di wilayah studi. Analisis neraca air dilakukan untuk mengetahui keseimbangan antara ketersediaan dan kebutuhan air sepanjang tahun serta menentukan volume tampungan optimal embung.

Hasil analisis menunjukkan bahwa kebutuhan air irigasi rata-rata sebesar 7786,88 m³ per hari atau sekitar 2,452,866.85 m³ per tahun, dengan debit andalan tahunan sebesar 2,944,773.756 m³. Volume tampungan efektif embung yang direncanakan adalah 32,676.12 m³ dengan kedalaman air 6 meter dan tinggi jagaan 1 meter. Berdasarkan analisis neraca air, embung mampu menyediakan air dengan kondisi surplus tahunan sebesar +491,906.89m³. Estimasi biaya pembangunan embung mencapai Rp 14.972.184.891,57 yang mencakup pekerjaan tanah, spillway, lapisan geomembran, pipa inlet–outlet, serta pekerjaan akses dan pengawasan. Hasil ini menunjukkan bahwa perencanaan embung di Desa Banjarsari layak secara teknis dan ekonomis serta berpotensi meningkatkan ketersediaan air irigasi di wilayah tersebut.

Kata kunci: *Embung, irigasi, debit andalan, neraca air, curah hujan, kapasitas tampungan, efisiensi irigasi, Desa Banjarsari, Kabupaten Banyumas.*

ABSTRACT

This study was conducted to design the construction of an embung (small reservoir) as an irrigation water supply facility in Banjarsari Village, Ajibarang Sub-District, Banyumas Regency. The area has a wide agricultural potential of approximately 84 hectares but often experiences water shortages during the dry season. The construction of the embung is expected to serve as an effective water storage solution to support the availability of water for agricultural land, as well as to optimize the utilization of rainfall and surface runoff. The objective of this study is to determine the storage capacity of the embung, the annual water balance, and the estimated construction cost based on the conditions of the research area.

The research method was carried out by collecting primary and secondary data, including rainfall data, climatological data, dependable discharge data (Q_{80}), and irrigation water demand data. Rainfall analysis was conducted to determine design rainfall and its distribution, while dependable discharge was calculated based on river discharge data used to supply the embung. Irrigation water demand was calculated using the water balance method by considering evapotranspiration, effective rainfall, irrigation efficiency, and the cropping pattern of farmers within the study area. Water balance analysis was conducted to identify the relationship between water availability and irrigation demand throughout the year and to determine the optimal storage volume required for the embung.

The results of the analysis show that the average irrigation water demand is 7,786.88 m³ per day or approximately 2,452,866.85 m³ per year, with an annual dependable discharge of 2,944,773.756 m³. The planned effective storage volume of the embung is 32,676.12 m³ with a water depth of 6 meters and a freeboard of 1 meter. Based on the water balance analysis, the embung can supply water with an annual surplus of +491,906.89 m³. The estimated cost of construction reaches Rp 14,972,184,891.57, which includes earthworks, spillway construction, geomembrane lining, inlet–outlet pipes, as well as access and supervision works. These results indicate that the embung design in Banjarsari Village is technically and economically feasible and has the potential to improve irrigation water availability in the area.

Keywords: embung, irrigation, dependable discharge, water balance, rainfall, storage capacity, irrigation efficiency, Banjarsari Village, Banyumas Regency.