

INTISARI

Potensi lahan rawa yang besar bisa dikembangkan untuk mengganti alih fungsi lahan pertanian yang terjadi. Daerah Irigasi Rawa (DIR) Terusan Tengah termasuk proyek strategis nasional untuk mewujudkan swasembada pangan. Tahun 2024 dilakukan rehabilitasi dan peningkatan jaringan pada DIR Terusan Tengah. Normalisasi saluran dan peningkatan bangunan air dilakukan dengan penambahan gorong-gorong pada bangunan eksisting. Penelitian ini bertujuan untuk memperoleh efektifitas dan dampak rehabilitasi yang telah dilakukan, pemasangan dan pengaturan pintu air pada saluran serta potensi sedimentasi saluran.

Pemodelan dilakukan dengan menggunakan HECRAS untuk menggambarkan kondisi eksisting, kondisi pascarehabilitasi serta dengan pengaturan dan pemasangan pintu air pada bangunan di saluran sekunder. Penambahan gorong-gorong terpasang pada bangunan eksisting yang terletak di tengah saluran sekunder, selain itu pengaturan pintu air disesuaikan dengan elevasi lahan pertanian. Pengamatan dilakukan pada 13 buah saluran sekunder kiri yang dilakukan rehabilitasi dan peningkatan.

Pada kondisi awal dan pascarehabilitasi volume air kumulatif pada saluran mengalami peningkatan 1,69% dibandingkan dengan kondisi eksisting untuk periode 14 hari dan 1,62% periode 24 jam, namun periode rata-rata deposisi meningkat 0,37%. Dengan kondisi pengaturan pintu air, saluran sekunder berhasil mempertahankan muka air saat kondisi air surut minimum hingga 259,55% dibandingkan tanpa pintu air. Namun total volume kumulatif untuk aliran masuk dan keluar di saluran sekunder menurun dibandingkan dengan saluran tanpa pintu air. Volume air masuk kumulatif turun 58,12%, volume air keluar turun 75,36%. Pada kondisi pintu air tertutup kecepatan jatuh D_{50} adalah 0.01 m/jam, partikel pasir sebesar 9,31 m/jam, partikel lanau sebesar 0,02 m/jam, serta partikel lempung sebesar 0.002 m/jam. Partikel pasir selama penutupan pintu air terjadi proses sedimentasi dengan rata-rata 0,56 m³ pada saluran periode simulasi yaitu 14 hari. Rehabilitasi DIR Terusan Tengah berhasil meningkatkan suplai air dan menjaga ketersediaan air pada saluran, namun peningkatan terjadi untuk potensi sedimentasi pada saluran dengan pengaturan dan penutupan pintu air pada saluran sekunder.

Kata kunci: Rehabilitasi, Pintu Air, Volume Air, Deposisi, Ketinggian Muka Air, Kecepatan jatuh

ABSTRACT

The vast potential of swampland can be developed to replace the conversion of agricultural land. The Terusan Tengah Swamp Irrigation Area (TT-SIA) is a national strategic project aimed at achieving food self-sufficiency. Rehabilitation and network improvements will be carried out in 2024 on the TT-SIA. Channel normalization and improvements to water structures will be carried out by adding culverts to existing structures. This study aims to determine the effectiveness and impact of rehabilitation, the impact of installing and adjusting sluice gates on the canal, and the potential for channel sedimentation.

Modeling was performed using HECRAS to depict existing conditions, post-rehabilitation conditions, and the adjustment and installation of sluice gates on structures in secondary canals. Culverts were installed on existing structures located in the middle of the secondary canals, and the sluice gates were adjusted to reflect the elevation of the agricultural land. Observations were made on 13 left secondary canals undergoing rehabilitation and improvement.

In the initial condition and after rehabilitation, the cumulative water volume in the channel increased by 1.69% compared to the existing condition over a 14-day period and by 1.62% over a 24-hour period; however, the average deposition period increased by 0.37%. With the condition of the sluice gate arrangement, the secondary channel was able to maintain the water level during low tide conditions by a minimum of 259.55% compared to when the sluice gate was not in place. However, the total cumulative volume for inflow and outflow in the secondary canal decreased compared to the canal without the sluice gate. The cumulative inflow volume decreased by 58.12%, and the outflow volume decreased by 75.36%. When the sluice gate is closed, the falling velocity D_{50} is 0.01 m/hour, sand particles are 9.31 m/hour, silt particles are 0.02 m/hour, and clay particles are 0.002 m/hour. Sand particles during sluice gate closure undergo a sedimentation process, with an average of 0.56 m³ in the channel during the 14-day simulation period. The rehabilitation of the Central Canal DIR has successfully increased water supply and maintained water availability in the canal. However, the potential for sedimentation has increased due to the regulation and closure of the secondary canal's floodgates.

Keywords: Rehabilitation, Sluiceways, Water Volume, Deposition, water surface elevation, Fall Velocity