EVALUASI LUAS DAERAH IRIGASI OPTIMUM DENGAN MODEL PROGRAM LINIER DAN MODEL RISIKO GAGAL LAHAN PADA DAERAH IRIGASI CIMULU

Shinta Awaliyah[1], Asep Kurnia Hidayat[2], Pengki Irawan[3]
Jurusan Teknik Sipil, Fakultas Teknik, Universitas Siliwangi
Jalan Siliwangi No.24 Tasikmalaya, Jawa Barat, Indonesia
E-mail : 207011043@student.unsil.ac.id

ABSTRAK

Daerah Irigasi Cimulu seluas 1.546,2 ha merupakan daerah irigasi pertanian di Kota Tasikmalaya. Sumber air pada Daerah Irigasi Cimulu berasal dari sungai Ciloseh. Kecukupan air merupakan salah satu faktor untuk memaksimalkan produksi pertanian pada Daerah Irigasi Cimulu. Penelitian bertujuan mengoptimalkan luas lahan dan keuntungan pada Daerah Irigasi Cimulu dengan menggunakan model program linier dan model risiko gagal lahan. Model program linier mengestimasi luas lahan optimal berdasarkan kecukupan air atau faktor k = 1. Model risiko gagal lahan mempertimbangkan faktor risiko dengan variasi faktor k. Hasil penelitian menunjukkan bahwa model program linier menghasilkan total keuntungan terbesar yaitu Rp54.276.548.310 dengan total luas lahan optimum 3.759,95 ha pada awal tanam November-1 menggunakan pola tanam padi-padi-palawija. Model risiko gagal lahan menghasilkan total keuntungan terbesar yaitu Rp96.165.135.900 dengan total luas lahan optimum 4.638,60 ha pada 10 skenario awal tanam dengan menggunakan debit bangkitan pola tanam padi-padi-padi. Kondisi terbaik terjadi pada awal tanam November-1 baik dengan debit eksisting maupun debit bangkitan, dengan pola tanam padi-padi-palawija sesuai pola tanam RTTG yang menghasilkan total keuntungan sebesar Rp72.737.886.600 dengan total luas lahan optimum 4.638,6. Kondisi optimum yang dihasilkan ini menandai awal musim hujan dan memberikan istirahat pada daerah irigasi. Penelitian ini diharapkan memberikan panduan bagi petani dalam mengelola daerah irigasi Cimulu serta meningkatkan efisien dan produktivitas pertanian di wilayah tersebut.

Kata Kunci : Optimasi, Program Linier, Risiko Gagal Lahan, Keuntungan, Pola Tanam

[1]Mahasiswa Jurusan Teknik Sipil, FT UNSIL

[2]Dosen Pembimbing Tugas Akhir 1, Dosen Teknik Sipil, UNSIL

[3]Dosen Pembimbing Tugas Akhir 2, Dosen Teknik Sipil, UNSIL

EVALUATION OF OPTIMUM IRRIGATION AREA WITH LINEAR PROGRAM AND LAND FAILURE RISK MODEL IN CIMULU IRRIGATION AREA

Shinta Awaliyah[1], Asep Kurnia Hidayat[2], Pengki Irawan[3]
Department of Civil Engineering, Faculty of Engineering, Siliwangi University
Siliwangi St No.24 Tasikmalaya, West Java, Indonesia E-mail :
207011043@student.unsil.ac.id

ABSTRACT

Cimulu Irrigation Area, covering an area of 1,546.2 ha, is an agricultural irrigation area in Tasikmalaya City. The source of water in the Cimulu Irrigation Area comes from the Ciloseh River. Water adequacy is one of the factors in maximizing agricultural production in the Cimulu Irrigation Area. The research aims to optimize the land area and profit in the Cimulu Irrigation Area by using a linear program model and a land failure risk model. The linear program model estimates the optimal land area based on water sufficiency, or factor k = 1. The land failure risk model considers risk factors with variations in the k factor. he land failure risk model considers risk factors with variations in the k factor. The results showed that the linear program model produced the largest total profit of Rp54,276,548,310 with an optimum total land area of 3,759.95 ha at the beginning of planting in November-1 using the rice-paddy-cropping pattern. The land failure risk model produces the largest total profit of Rp96,165,135,900 with an optimum total land area of 4,638.60 ha in 10 early planting scenarios using the generation discharge of rice-paddy cropping patterns. The best condition occurs at the beginning of planting November-1 both with existing discharge and generation discharge, with a rice-paddy-cropping pattern according to the RTTG planting pattern which produces a total profit of Rp72,737,886,600 with a total optimum land area of 4,638.6. The resulting optimum condition marks the beginning of the rainy season and provides a break for the irrigation area. This research is expected to provide guidance for farmers in managing the Cimulu irrigation area and improve the efficiency and productivity of agriculture in the region.

Keyword : *Optimization, Linear Programming, Land Failure Risk, Profit, Cropping Pattern*

[1]Student of Civil Engineering Department, Faculty of Engineering Siliwangi University

[2]Supervisor of Final Project 1, Civil Engineering Lecturer, Siliwangi University

[3]Supervisor of Final Project 2, Civil Engineering Lecturer, Siliwangi University