

ABSTRAK

Buah naga merupakan komoditas hortikultura dengan permintaan yang terus meningkat. Salah satu upaya menjaga stabilitas produksi melalui penggunaan lampu LED. Penelitian ini dilaksanakan di Desa Kembiritan, Kecamatan Genteng, Kabupaten Banyuwangi pada September–November 2025. Tujuan menganalisis efisiensi teknis penggunaan faktor produksi serta faktor sosial ekonomi yang memengaruhi efisiensi teknis usahatani buah naga pengguna lampu LED. Metode yang digunakan adalah *Data Envelopment Analysis* (DEA) untuk mengukur efisiensi teknis dan regresi Tobit untuk menganalisis pengaruh faktor sosial ekonomi. Hasil DEA dengan asumsi *Variable Return to Scale* (VRS) menunjukkan bahwa 60% responden telah mencapai efisiensi teknis, sedangkan 40% responden 40% belum efisien dengan nilai efisiensi berkisar 0,199–0,831. Responden yang efisien menjadi *benchmark* bagi responden lain. Pada responden nomor 1, acuan efisiensi adalah responden 4, 24, 7, dan 14 dengan nilai lambda masing-masing 0,246; 0,100; 0,148; dan 0,596, sehingga responden 14 menjadi acuan utama. Berdasarkan *projection summary*, produksi responden nomor 1 berpotensi meningkat dari 2.500 kg menjadi 8.818 kg melalui pengurangan penggunaan input tiang panjat, bibit, dan instalasi listrik sedangkan luas lahan, lampu LED, pupuk, fungisida, insektisida, dan tenaga kerja tidak memerlukan penyesuaian. Hasil regresi Tobit menunjukkan bahwa pendidikan, pengalaman usaha, jumlah anggota keluarga, keanggotaan kelembagaan, dan sumber modal petani tidak berpengaruh signifikan terhadap efisiensi teknis. Kondisi ini diduga disebabkan oleh kesamaan karakteristik sosial ekonomi antar petani sehingga pengaruh variabel tersebut belum terlihat secara nyata.

Kata kunci: buah naga, *Data Envelopment Analysis* (DEA), efisiensi teknis, regresi Tobit.

ABSTRACT

Dragon fruit is a horticultural commodity with continuously increasing market demand. One strategy to maintain production stability is the use of LED lighting technology. This study was conducted in Kembiritan Village, Genteng District, Banyuwangi Regency, from September to November 2025. The objectives of this study were to analyze the technical efficiency of production factor utilization and to identify the socioeconomic factors affecting the technical efficiency of dragon fruit farming using LED lighting. Data Envelopment Analysis (DEA) was employed to measure technical efficiency, while Tobit regression was used to examine the influence of socioeconomic factors on technical efficiency. The DEA results under the Variable Returns to Scale (VRS) assumption indicated that 60% of the respondents were technically efficient, whereas the remaining 40% had not yet achieved technical efficiency, with efficiency scores ranging from 0.199 to 0.831. Efficient respondents served as benchmarks for inefficient respondents. For respondent number 1, the reference peers were respondents 4, 24, 7, and 14, with lambda values of 0.246, 0.100, 0.148, and 0.596, respectively, making respondent 14 the primary benchmark. Based on the projection summary, respondent number 1 had the potential to increase production from 2,500 kg to 8,818 kg by reducing the use of climbing poles, seedlings, and electricity installation, while no adjustments were required for land area, LED lamps, fertilizers, fungicides, insecticides, and labor inputs. The Tobit regression results revealed that education level, farming experience, household size, institutional membership, and source of capital had no statistically significant effect on technical efficiency. This finding is likely attributable to the relatively homogeneous socioeconomic characteristics among farmers, which limited the observable influence of these variables.

Keyword : Data Envelopment Analysis (DEA), dragon fruit, technical efficiency, , Tobit regression.