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ANALYSIS OF INPUT EFFICIENCY AND ECONOMIES OF SCALE IN SALT PRODUCTION IN BULELENG REGENCY

Ketut Dyana Novita Sari[1], Ni Luh Karmini[2]
[1] Faculty of Economics and Business, Udayana University, dyananovita8@gmail.com
[2] Faculty of Economics and Business, Udayana University
* CorrespondingEnglish Author: Ketut Dyana Novita Sari

Abstract: Indonesia, widely recognized as a maritime country with vast marine potential, has yet to achieve salt self-sufficiency despite its favorable geographical conditions. This study aims to analyze the efficiency of input utilization and economies of scale in salt production in Buleleng Regency, one of the main salt-producing regions in Bali Province. A quantitative approach using an associative method and the Cobb-Douglas production function model was employed to examine the influence of capital, labor, land area, and technology on salt production. The sample consisted of 126 traditional salt farmers selected using proportionate stratified random sampling. The results indicate that all input variables—capital, labor, land area, and technology—have a positive and significant effect on production, both partially and simultaneously. Salt production in Buleleng exhibits increasing returns to scale, suggesting potential for output expansion if inputs are optimized. The efficiency analysis reveals that capital, land area, and geomembrane technology are not yet utilized optimally (Ef > 1), while labor is used excessively (Ef < 1). Additionally, the production process is highly dependent on weather conditions, as all salt farmers can only operate during the dry season. These findings underscore the importance of improving access to technology and enhancing input management efficiency to support increased productivity and national salt self-sufficiency.
Keywords: salt production, input efficiency, economies of scale, Cobb-Douglas, Buleleng, traditional salt farming

INTRODUCTION

Indonesia remains one of the largest salt importers in Asia, despite its immense potential as a maritime nation with an extensive coastline. In 2023, the country imported 2.807 million tons of salt, up from 2.756 million tons the previous year. This reflects a high dependence on imported salt, even though Indonesia's geographical and climatic conditions theoretically provide the capacity to achieve self-sufficiency (BPS, 2024; Jamil et al., 2017). To address this issue, the government has designated salt as one of 26 priority commodities for downstream industrialization within the national development agenda, aimed at boosting production through investment and modernization in the salt sector (Tirta, 2024).

However, national salt production between 2015 and 2023 exhibited a fluctuating trend. Extreme weather events—such as the La Niña phenomenon in 2016—led to a drastic decline in output, dropping to only 0.168 million tons. Conversely, 2015 and 2023 recorded the highest production levels, at 2.9 and 2.5 million tons respectively. These fluctuations are driven not only by climate variability but also by inefficient, traditional production methods and limited availability of salt ponds (BMKG, 2021; Mangeswuri & Ramadhan, 2024). Although production in 2023 exceeded the national target of 1.7 million