World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:18, No:01, 2024

EcoMush: Mapping Sustainable Mushroom Production in Bangladesh

Authors : A. A. Sadia, A. Emdad, E. Hossain

Abstract : The increasing importance of mushrooms as a source of nutrition, health benefits, and even potential cancer treatment has raised awareness of the impact of climate-sensitive variables on their cultivation. Factors like temperature, relative humidity, air quality, and substrate composition play pivotal roles in shaping mushroom growth, especially in Bangladesh. Oyster mushrooms, a commonly cultivated variety in this region, are particularly vulnerable to climate fluctuations. This research explores the climatic dynamics affecting oyster mushroom cultivation and, presents an approach to address these challenges and provides tangible solutions to fortify the agro-economy, ensure food security, and promote the sustainability of this crucial food source. Using climate and production data, this study evaluates the performance of three clustering algorithms -KMeans, OPTICS, and BIRCH- based on various quality metrics. While each algorithm demonstrates specific strengths, the findings provide insights into their effectiveness for this specific dataset. The results yield essential information, pinpointing the optimal temperature range of 13°C-22°C, the unfavorable temperature threshold of 28°C and above, and the ideal relative humidity range of 75-85% with the suitable production regions in three different seasons: Kharif-1, 2, and Robi. Additionally, a user-friendly web application is developed to support mushroom farmers in making well-informed decisions about their cultivation practices. This platform offers valuable insights into the most advantageous periods for oyster mushroom farming, with the overarching goal of enhancing the efficiency and profitability of mushroom farming.

Keywords : climate variability, mushroom cultivation, clustering techniques, food security, sustainability, web-application
Conference Title : ICAAS 2024 : International Conference on Agriculture and Applied Statistics
Conference Location : New York, United States
Conference Dates : January 29-30, 2024