

Forecasting of fish production, export and import of Sri Lanka Using Machine Learning Models

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Fish forecasting is important to manage available resources, implement new rules and regulations for sustainable economic growth, and ensure food and nutrition security. It is a global trend to use machine learning based on artificial intelligence in many aspects of the fisheries sector. In this study, Support Vector Regression (SVR) supervised machine-learning model was used to forecast fish production, fish imports, and exports in Sri Lanka. Using the Mean Absolute Percentage Error (MAPE) accuracy of the model was calculated. A sixteen-year retrospective analysis (2005-2021) of five-year catch forecast indicates that although the total fish production is predicting a decrease (from 415518 ± 14340 metric ton for 2022 to 276525 ± 14340 Mt for 2026), inland aquaculture and fisheries production is predicting an increase (from 105340 ± 2817 Mt for 2022 to 2122740 ± 2817 Mt for 2026) for the next five years. Forecasted imports values show an increase of fish and fishery products (from 59960 ± 2038 Mt for 2022 to 82584 ± 2038 Mt for 2026) for the upcoming five years, and the predicted fish exports values for 2022 and 2026 are 30202 ± 350 Mt and 22023 ± 350 Mt, respectively. MAPE for total fish production, total marine capture, inland and aquaculture fish production, fish import and export are 4.2, 4.4, 4.2, 2.3, and 1.7 respectively. The established SVR model provides high accuracy (MAPE values are less than 10) even with sixteen years of data, indicating the benefits of using machine-learning models for forecasting.

Keywords: Fisheries Forecast, Support Vector Regression, fish catch, Fish imports and exports

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