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**SRI LANKAN GOVERNMENT FERTILIZER BAN
POLICY'S IMPACT ON TEA EXPORTATION**

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Thesis submitted in partial fulfillment of the requirements for the degree
Master of Science in Operational Research

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Declaration page of the candidate & supervisor

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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Abstract

The recent policy of the Sri Lankan government, banning chemical fertilizers, has sparked discussions and concerns regarding its impact on several industries. Among them, the tea industry draws utmost attention due to its contribution to Sri Lanka's export revenue. Sri Lankan tea is worldwide renowned for its high quality, and tea exports significantly contribute to Sri Lanka's economic growth. Since Sri Lanka's economy relies heavily on tea exports, it is crucial to examine the possible outcomes of the government policy on fertilizer importation. Although the objective of this move by the Sri Lankan authorities is to advance organic farming in order to maintain environmental sustainability, the immediate effects on tea production and exportation have to be well studied. Since independence, the Sri Lankan government has followed numerous policies in the agricultural sector. Tea has earned a greater attention of government agricultural policy since it is the single most important crop next to rice. While there is limited research specifically addressing the impact of government fertilizer ban policy on tea exports in Sri Lanka, there is a timely requirement in studying the impact on the tea industry due to government policy changes. The significance of this study lies in its potential to revise the agricultural practices as well as the economic dynamics of one of the country's key industries. Since Sri Lanka is globally renowned for its high-quality tea, any policy involved in its production procedure has considerable implications. The aim of this study is to evaluate the impact of the Sri Lankan government's fertilizer ban policy on tea exportation. This research analyzed how the policy has influenced export volumes and trends, utilizing quantitative methods to assess the short-term and long-term effects on the tea industry. Tea export data, tea production data, and fertilizer import data from 2012 to 2022 were used in this study. As the methodology, time series approaches were used in this study in order to separately identify the short-term impact of Sri Lanka's government fertilizer ban policy. Granger causality tests were conducted, and long-term relationships were checked using co-integration tests. The ARIMA and ETS models along with VAR models and VECM were built to identify the effects of fertilizer banning. There was clearly a short-term relationship between fertilizer imports and tea exports as well as tea exports and total tea production. Based on the findings of the analysis, we can conclude that the ban on fertilizer importation impacts tea exportation more significantly than tea production. This is likely because quality of tea, which is crucial for exportation, is more directly affected by the availability of fertilizers than the overall quality of tea produced. Usually, tea exports have to be of high quality. Due to the fertilizer import ban, there must be a lack of fertilizer used, resulting in a quality drop in tea produced.

Key words: Time Series, Multivariate Analysis, Granger Causality, Co integration, ARIMA Model, ETS Model, VAR Model, VECM Model

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List of Abbreviations

Abbreviation	Description
ARIMA	Auto Regressive Integrated Moving Average
ETS	Exponential Smoothing State Space
VAR	Vector Autoregressive models
HS Code	Harmonized System Code
WCO	World Customs Organization
CCF	Cross Correlation Function
STL	Seasonal and Trend decomposition using Loess
ADF Test	Augmented Dickey-Fuller Test
IRF	Impulse Response Function
VDC	Variance Decomposition
MAE	Mean Absolute Error
RMSE	Root Mean Squared Error
ACF	Autocorrelation Function
PACF	Partial Autocorrelation function
MA	Moving Average
AR	Autoregressive
ARCH	Autoregressive Conditional Heteroskedasticity test
VECM	Vector Error Correction Model