Analysing Global Agricultural Land Use Dynamics and Projections

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GitHub: https://github.com/Vijaygopi3120/ds1a3.git

Introduction

The dynamics of agricultural land use provide critical insights into food security, economic development, and environmental sustainability. This poster presents an analysis of agricultural land trends and their broader implications.

Aim

To analyse global agricultural land use data to understand its development over time and to forecast future trends.

Objectives

- To categorize global agricultural land data by country.
- To identify historical trends in agricultural land use.
- To predict future agricultural land availability using statistical models.

Literature Review

van Meil *et al.*, (2006) highlight the fluctuating nature of agricultural land use due to economic, climatic, and policy factors.

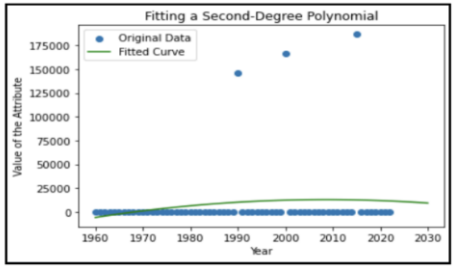
Berry (2006) underscores the need for sustainable land management to balance food production with ecological preservation.

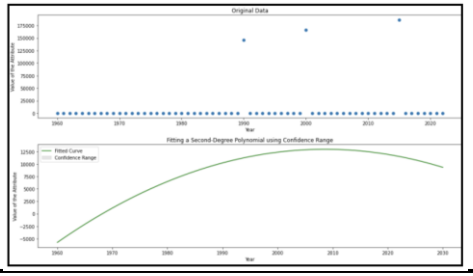
Methods

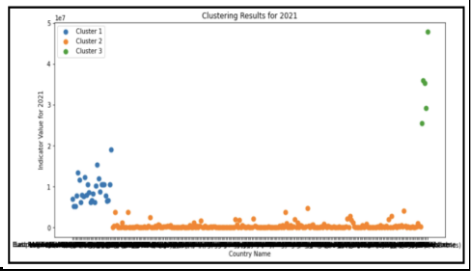
- Employed K-means clustering to categorize countries based on agricultural land area.
- Utilized the Elbow Method to ascertain the optimal number of clusters.
- Analysed time-series data with polynomial fitting to discern historical trends and forecast future land use.

Results

- Clustering revealed distinct groups of countries based on the size of agricultural land.
- Polynomial fitting indicated a steady trend in agricultural land use, with slight fluctuations aligning with historical events.







Future Work

- Integrate additional variables such as water usage and crop yield for a more comprehensive analysis.
- Examine the distribution and production of agricultural land as impacted by climate change.

References

- van Meil, H., Van Rheenen, T., Tabeau, A. and Eickhout, B., 2006. The impact of different policy environments on agricultural land use in Europe. Agriculture, Ecosystems & Environment, 114(1), pp.21-38.
- Berry, P.M., Rounsevell, M.D., Harrison, P.A. and Audsley, E., 2006. Assessing the vulnerability of agricultural land use and species to climate change and the role of policy in facilitating adaptation. Environmental science & policy, 9(2), pp.189-204.