

Topic 21

Title: "A Comprehensive Analysis of Land Use and Land Cover Classes Impact on State-wise Economic Growth: The Dynamics between LULC Trends and GDP"

Description:

This project aims to explore the intricate relationship between the Land Use and Land Cover (LULC) classes of each Indian state and its corresponding Gross Domestic Product (GDP) from various activities such as Production of total food grains, Agriculture, Net irrigated area and Industry, over multiple years. By exploring the relationship between environmental characteristics and economic performance, this study seeks to unravel the underlying patterns and correlations that contribute to state-level economic dynamics.

Objectives:

- Establish a robust relationship between LULC classes and GDP for various states.
- Determine the correlation between various LULC classes and GDP values.
- Identify the most influential attributes within the LULC classes related to GDP from various activities.
- Visualize the trends of each LULC class against GDP values across multiple years.

Expected Outcomes:

- a. Correlation Analysis: Quantify and analyze the correlation between LULC classes and GDP values, providing valuable insights into their interconnectedness.
- b. Feature Importance: Pinpoint the most influential attributes within the LULC classes dataset, facilitating an understanding of their impact on economic growth.
- c. Trend Visualization: Develop representations of the trends of each LULC class against GDP values, offering a comprehensive overview of their temporal dynamics.

Relevant Data and Data Sources:

- a. LULC Data: The LULC data will be provided.
- b. GDP/NDP Data: Obtain Gross Domestic Product (GDP) data from the Reserve Bank of India (RBI) website, ensuring a match with the LULC data year-wise (<https://www.rbi.org.in/Scripts/AnnualPublications.aspx?head=Handbook+of+Statistics+on+Indian+States>).

Steps to Achieve Objectives:

- a. Dataset Preparation: Find the distribution and composition of each class for the states. Download and prepare GDP data for same years.
- b. Feature Engineering: Determine the share of each LULC class for various states, preparing the dataset for subsequent modelling (retaining only the most influential attributes for GDP).

c. Machine Learning/Deep Learning Modeling: Apply advanced ML/DL techniques capable of capturing the intricate relationship between LULC trends and GDP.

Evaluation:

a. R2 Score: Utilize the R2 score as a metric for evaluating the model's accuracy in capturing the relationship between LULC classes and GDP values.

b. Feature Importance Analysis: Identify the most influential attributes within the LULC dataset for GDP.

c. Recognition: Acknowledge and reward students who achieve accurate and insightful results for multiple states using valid methodology.

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