

Statistical analysis of economic indicators and production rate of major crops for finding out the co-relation and impact of them on overall economic growth based on Machine Learning

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Overview

In this project, we will analyze the inter-relations of economic indicators [Inflation Rate, Consumption, Savings, Sectoral Growth Rate, Foreign trade and Performance of Government], production rate of Major Crops and their impact on overall economy specially on Gross Domestic Product (**GDP**) and Gross National Income (**GNI**) from 2012-2016 through machine learning approach.

Goals

- Judging the overall health of the economy.
- Finding out the individual impacts of indicators on economy.
- Predicting the future movement of economy.
- Making business plan and investment decisions.

Methodology

Dataset

- Daily-Total-Rainfall-Till-Jun-2014
- Rice-Export-Data

- Rice-Import-Data
- Bangladesh-literacy-rate
- Bangladesh-population-growth-ratio
- GDP-growth-rate-in-Bangladesh
- rice-export-2010-2015
- Area under cultivation of different crops 2014-15
- Consumption at current prices 2012-16
- Foreign trade performance 2012-16
- GDP at Current and Constant Market Prices 2012-16
- GNI at Current and Constant Market Places 2012-16
- Investment as percentage of GDP 2012-16
- Performance of government 2012-16
- Production of Major Crops 2010-16
- Savings and Investments 2012-16
- Sectoral Growth rate of GDP at constant Prices 2012-16
- Sectoral Growth Rate of GDP at Current Prices (Agriculture) 2012-16
- Shares of Public and Private Investment 2007-16
- Total Foreign Exchange Reserve 2012-16

Data Collection

All datasets were collected from <http://data.gov.bd/>

Balancing Dataset

All datasets were minimized to the timeline of 2012-2016.

Impact of Features

Private investment had an adverse impact on **GDP** and **GNI** where public investment showed a positive impact on economy. Private consumption and public consumption both had a positive influence. Economy was dependent on Agricultural for a certain time after that it was moved to Industry and was dependent on Service growth rate from the beginning of 2012. Besides, investment had a great impact on economy. Rise of major crops production flourished our economy but after the industrial dependency jute production showed a good impact. However, Budget deficit was proportional to the economic growth. Taxes didn't have a significant impact on economy. Domestic and National savings as well as foreign exchange also had a positive impact. Export and import got lessened with the development of economy and rainfall couldn't affect export and import of crops at a large extent. Population growth is not in favour of **GDP** growth. Lastly, **GDP** highly depends on literacy rate also.

Model Building and Training

DecisionTreeRegressor, **ExtraTreesClassifier**, **LinearRegression**, **RandomForestRegressor** and **Convolutional Neural Network** were applied on dataset. Datasets were split into Training and Testing sets before applying the models. **LinearRegression** performed best among them with minimum **Mean-Square Error**.

Required Tools

Project was done on **Anaconda** Platform in **Python** Language.