The Correlations of Ecological Footprint and Human Activity in 3 Decades

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Background

In recent years, more destructive drought, flooding, and hurricane are appeared more frequently due to the El Niño and La Niña phenomena.

One of the crucial factors of the phenomena can be attributed to the excessive and continuous emission of carbon dioxide which leads to more serious of global warming. It is a very meaningful and interesting topic to analyze dataset "National Footprint Accounts 2018" of different countries over 50 years via ecological footprint, biocapacity, population, and GDP of the countries and predict the future sustainability trend among the countries.

The result will be useful for evaluating the balance between economic development and impacts on the environment. Suggested measures on protecting the environment and maintaining the sustainability of countries will be provided based on the results and underlying reasons.

Introduction

Our dataset is about Ecological Footprint for 196 countries for data years 1961 through 2014, which measures the demand on and supply of nature.

For the demand of nature, it mainly focuses on the natural resources consumed by a given population requires to produce ecological assets and to absorb the waste in the process, especially carbon emissions. About nature resources [1], there are six categories of productive surface areas: cropland, grazing land, fishing grounds, built-up land, forest area, and carbon demand on land. For the supply of nature, the biocapacity of a specific place, taking a city as an example, represents the productivity about ecological assets.

With measuring both demand and supply of nature about a place for a period of time, we could have a conclusion about the trend of the ecosystem for those 196 countries and have a reasonable prediction of the future development of it. Therefore, we could give a suitable solution to improve the current situation of extreme weather.

Project Planning

The project will mainly focus on the data application with the cloud system. Through the utilization of the data - National Footprint Accounts 2018 of the ecological footprint of 196 countries, this project will analysis the relation between population and ecological footprint of consumption, also just called ecological footpr

Reference

[1] N.D. "Ecological Footprint" 2018; https://www.footprintnetwork.org/our-work/ecological-footprint/

[2] N.D. "National Footprint Accounts 2018" 2018; https://www.kaggle.com/footprintnetwork/national-footprint-accounts-2018.

int and biocapacity [2]. This project covers certain scales, we have broken down into three parts - data mapping and reducing, data integration and analyzation and result visualizing and conclusion drawing.

In the project, we will applicate AWM EC2, Spark and Python as the supporting, which is using for building a cloud system, handling and integrating data and plotting graph. We are going to make use of the Spark for mapping and reducing the large size of data, also the structure of the data is design purposely for further application. With the help of AWS EC2, we can easily to calculate and make different result with the graph by Python. The challenge of the project is the mapping and reducing of the the data, which require a user-friendly data structure for utilization. We are necessary to design a better structure for handling data instead of using the original one. The results show that how the carbon emissions affected by the population increasing and the trend of GDP, and the change of different land space also. The results provide the conclusion with for the analysis research form data study.