Introduction

In this report, I will be discussing the climate change, specifically on the topic of forest land against arable land, which is essentially deforestation in first, second and third world countries. Deforestation has been a problem worldwide and a huge contribution to climate change. To find whether countries from different development stage are all contributing to deforestation, a simple correlation will tell us if deforestation is possibly occurring in the countries. However, that does not mean causation, only a relationship between the two variables. Within these datasets, I have picked Brazil, Mongolia and Australia and I used time series plots to observe trends, scatter plots to show a graphical relationship between the variables and tables with statistical properties.

1. Forest and arable land

On figure 1, I have three countries from first, second and third world. Australia being the first, Mongolia being the second and Brazil as the third. For Brazil, Mongolia and the world, there is a downward trend in forest land whilst a slight to obvious upward trend in arable land for all countries including the world. The most peculiar part for the ‘world’ plot is that there is a sudden shift upwards with arable land since the 2010 and countries like Australia and Mongolia also shows a spike starting in the year 2010. While every country shows a drop in forest land, Australia has managed to increase their forest drastically since the 2010.

Chart, line chart

Description automatically generated

Figure : Time series plots of Brazil, Australia, Mongolia and the World

1. Correlation between variables

Visually, it appears that there is a positive correlation of Greenhouse and Arable land with Australia and Brazil indicating that greenhouse gases increase as arable increase and a loose correlation for Mongolia and World. However, a numerical value would give a better indicator of correlation and table 1 shows there is a valid negative correlation for Brazil in column arable-forest which denote there is a sign of deforestation but not so for the rest of the countries. Concrete positive correlation for Brazil and World for increase of greenhouse and arable land while a vague one for World meaning there seem to be quite a clear relationship between the two variables. Forest-Greenhouse column shows a negative correlation between all columns especially for Brazil and World where it shows a clear sign of increase of greenhouse when forest land is reducing.

Chart, scatter chart

Description automatically generated

Figure : Correlation plot for Greenhouse in unit of kiloton and Arable land in percentage

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Arable-Forest* | *Arable -Greenhouse* | *Forest-Greenhouse* |
| *Brazil* | -0.89 | 0.92 | -0.98 |
| *Australia* | -0.24 | 0.79 | -0.49 |
| *Mongolia* | 0.29 | 0.386 | -0.65 |
| *World* | -0.17 | 0.55 | -0.94 |

Table 1: Correlation of Arable-Forest, Arable-Greenhouse and Forest-Greenhouse between countries and the world

1. Statistical properties of Forest Land (Sq Km)

|  |  |  |  |
| --- | --- | --- | --- |
| *Forest land* | *Mean (sq km)* | *Changes % (1990-latest)* | *Land changes (sq km)* |
| *Brazil* | 5x106 | - 15.669 % | -9.2x105 |
| *Australia* | 1.3x106 | 0.09 % | 0.09 |
| *Mongolia* | 1.4x105 | - 1.25 % | -1792.2 |
| *World* | 4.05x107 | - 3.21 % | -1.3x106 |

Table 2: Mean and percentage change of forest land

Table 2 shows that Brazil has the highest drop in percentage. However, Australia has increased their forest as of 2020 ever since their movement to replanting trees in 2010. But there is a clear sign that forest land is decreasing around the world, and it is a sign of concern since climate change are worsening.