Worldbank Agriculture Analysis

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Introduction

This analysis explores relationships between indicators across countries such as percentage of agricultural land, CO2 emissions per capita, and size of surface area using World Bank data. It is divided into two main parts:

1. Is there a relationship between the percentage of agricultural land and CO2 emissions per capita across countries?
2. Does the size of the surface area of the country play a role?.

1. Percentage of agricultural land and CO2 emissions per capita

We analyze whether the percentage of agricultural land relates to the CO2 emissions per capita. To get an overview over the interested data and be able to to evaluate future insights correctly, we start by looking at the two indicators separately. Starting with the distribution of the CO2 emissions, we get the following information.

CO2 Emissionen pro Kopf

Min. 1st Qu. Median Mean 3rd Qu. Max.
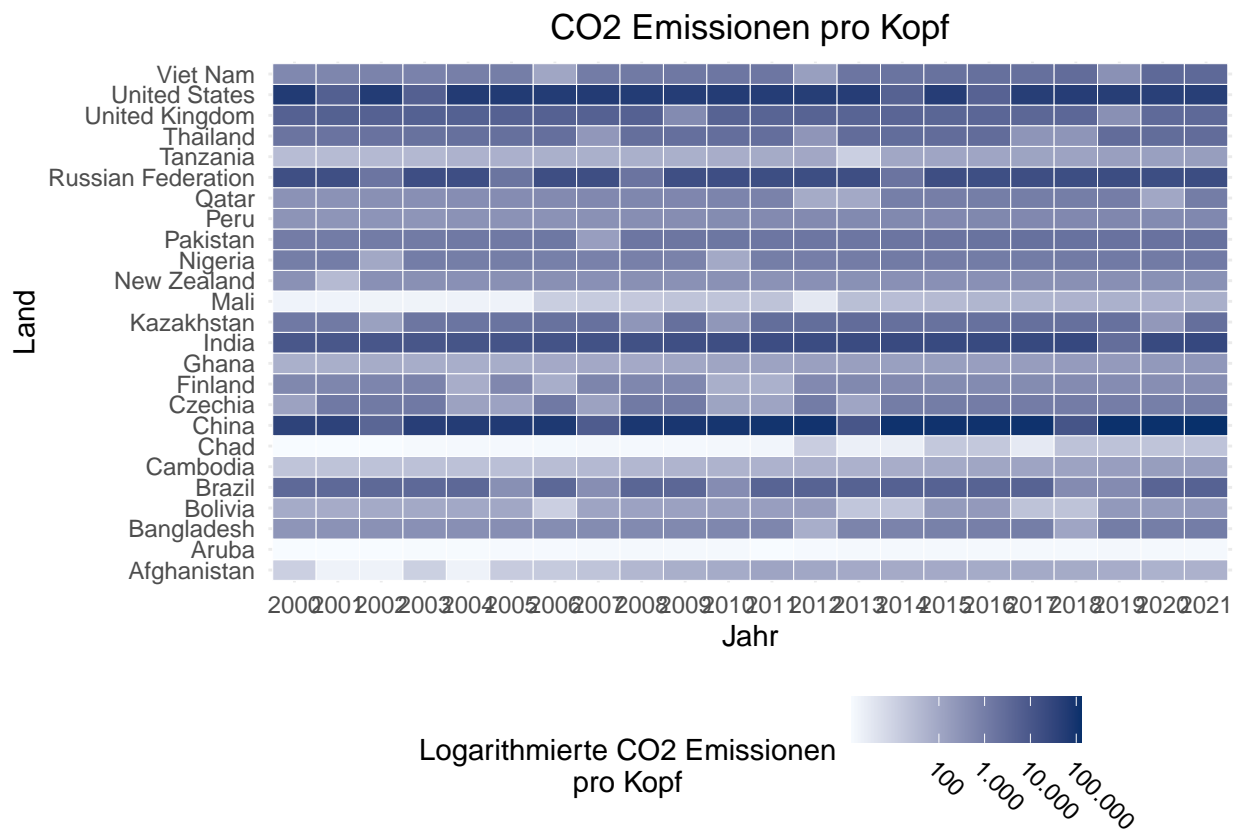
```
##      0.25     87.82    524.52   6731.45   2344.69 127176.55
```
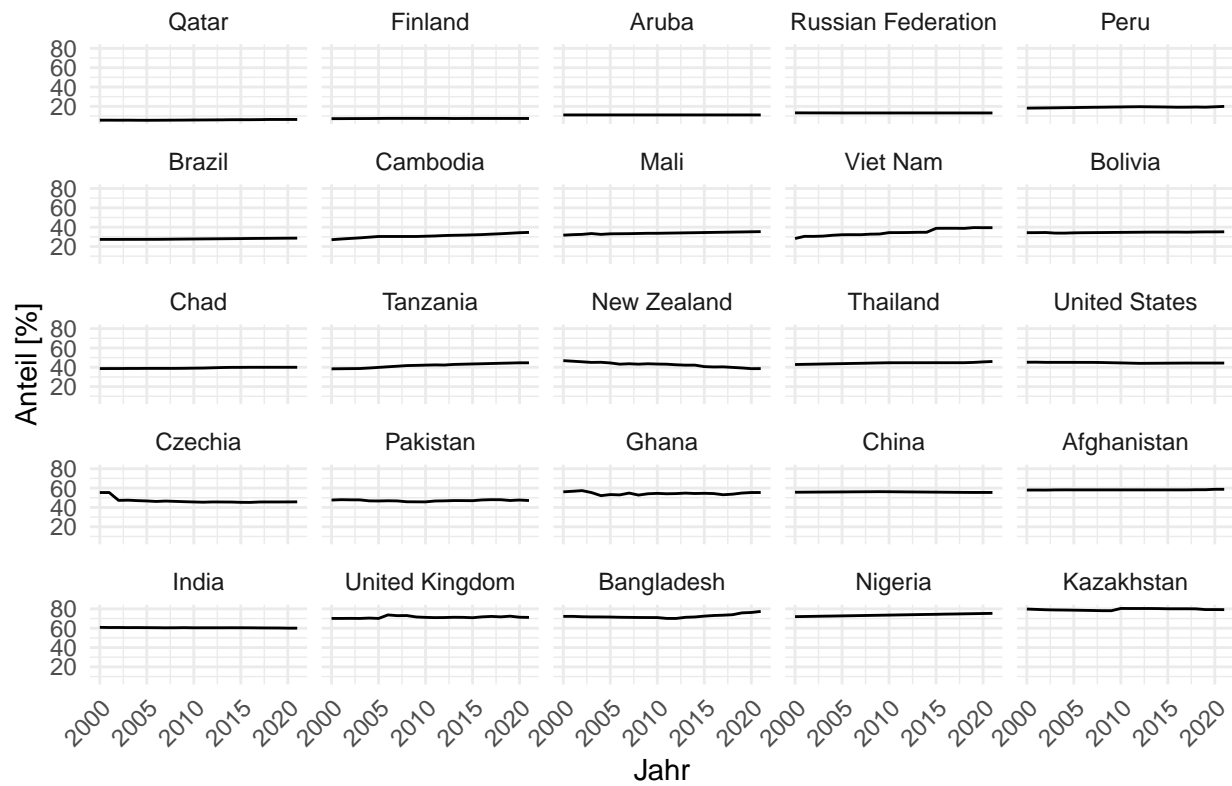
Streuungszerlegung der CO2 Emissionen pro Kopf bezüglich Länder
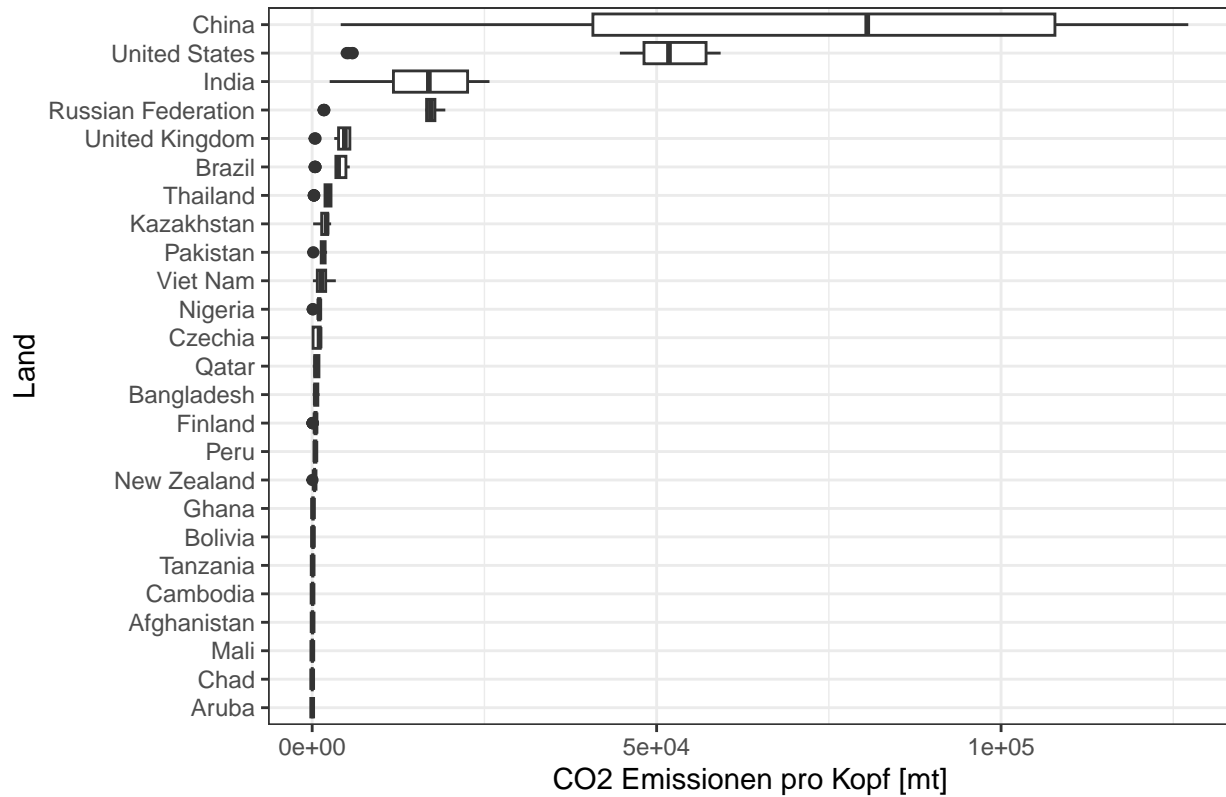

```
## Streuung zwischen den Ländern:  279766568
```

The CO2 emissions have high variance within the countries. Simultaneously, there are enormous differences in absolute amounts between the countries. Therefore, the greatest challenge may lie in comparing the different countries' values and trends although the data is provided on a per capita basis. Furthermore, the distribution of the percentage of agricultural land delivers the following information.

Landwirtschaftliche Nutzfläche


```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   5.564  29.805  43.411  42.040  56.129  80.439
```

Streuungszerlegung der landwirtschaftlichen Nutzfläche bezüglich Lär
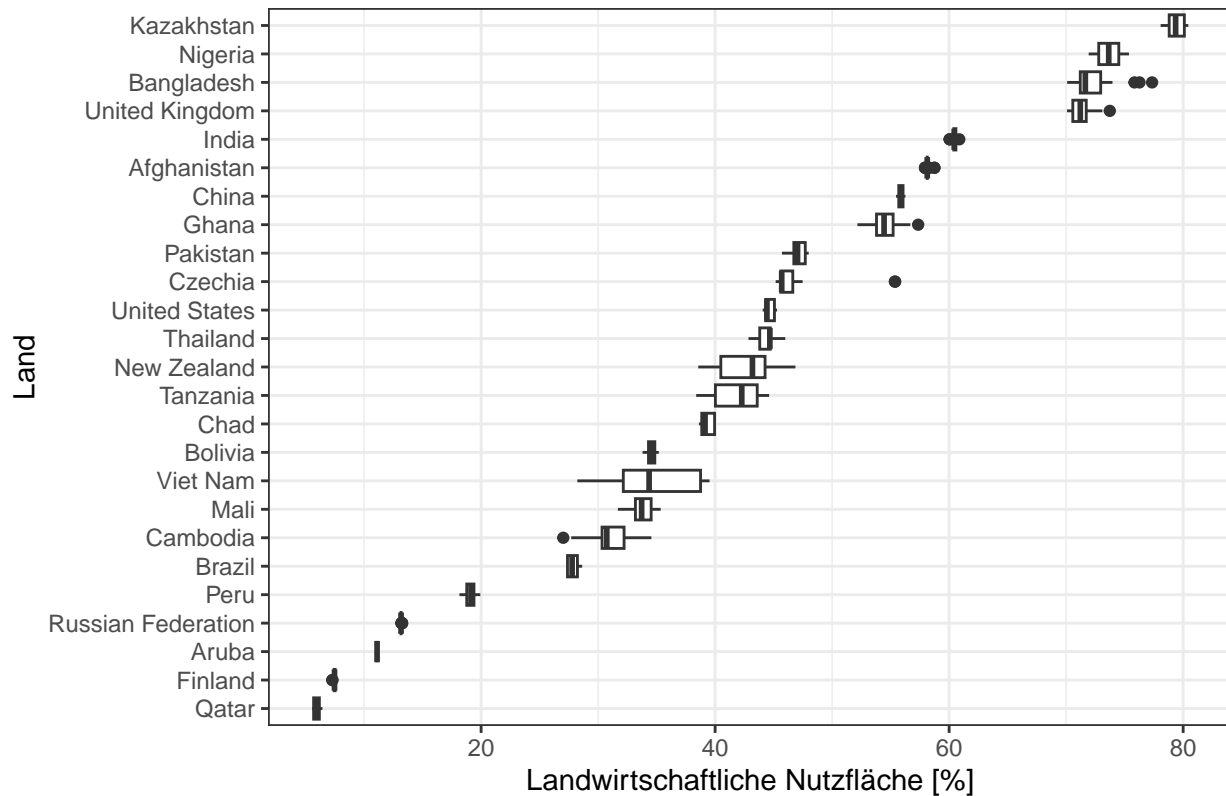

```
## Streuung zwischen den Ländern:  437.7944
```

In contrast to the CO2 emissions, the percentages of agricultural land have rather low variance within the countries. However, there are recognizable deviations between the countries, spanning from only five to up to eighty percent. As we operate on a capped percentage scale though, comparisons should be possible quite well. Moving on, we want to bring those two variables back together. For this purpose, analyzing the distribution of the collected data while disregarding the country-specific origin gives us this cloud of data points. Note, that the CO2 emissions are displayed logarithmic to counter the expansive value disparity in the data.

Zusammenhang zwischen CO2 Emissionen pro Kopf
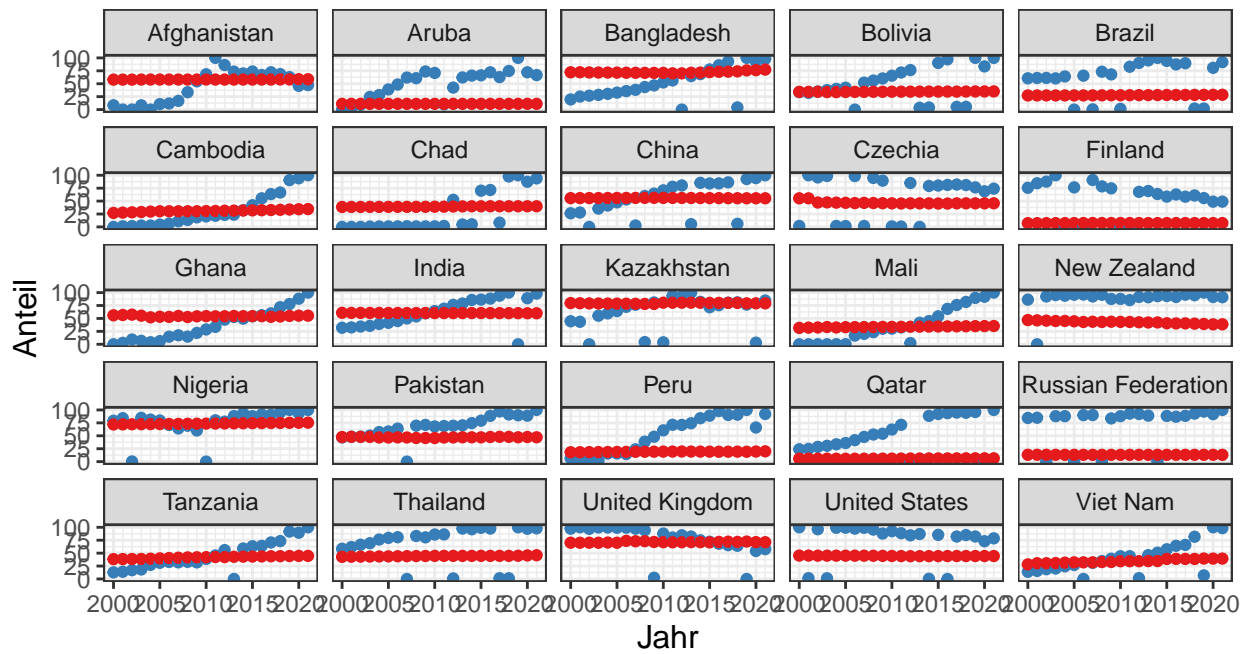## und landwirtschaftlicher Nutzfläche
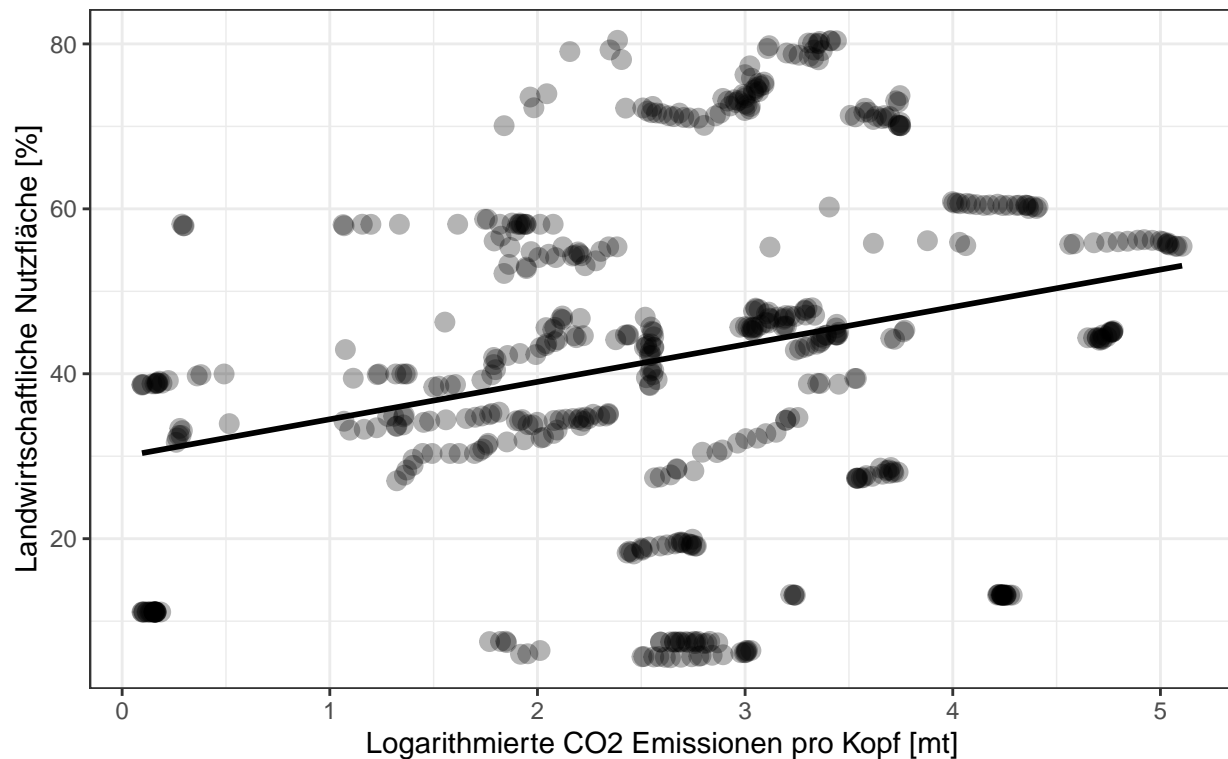
We can recognize a slightly positive linear trend between the variables. However, the development over time and the country-specification of observations are completely ignored. In order to take those factors back into consideration, we first distinguish among the countries by facetting our visualization for an in depth comparison of the indicators for each country over time.

Zusammenhang zwischen CO2 Emissionen pro Kopf und landwirtschaftlicher Nutzfläche
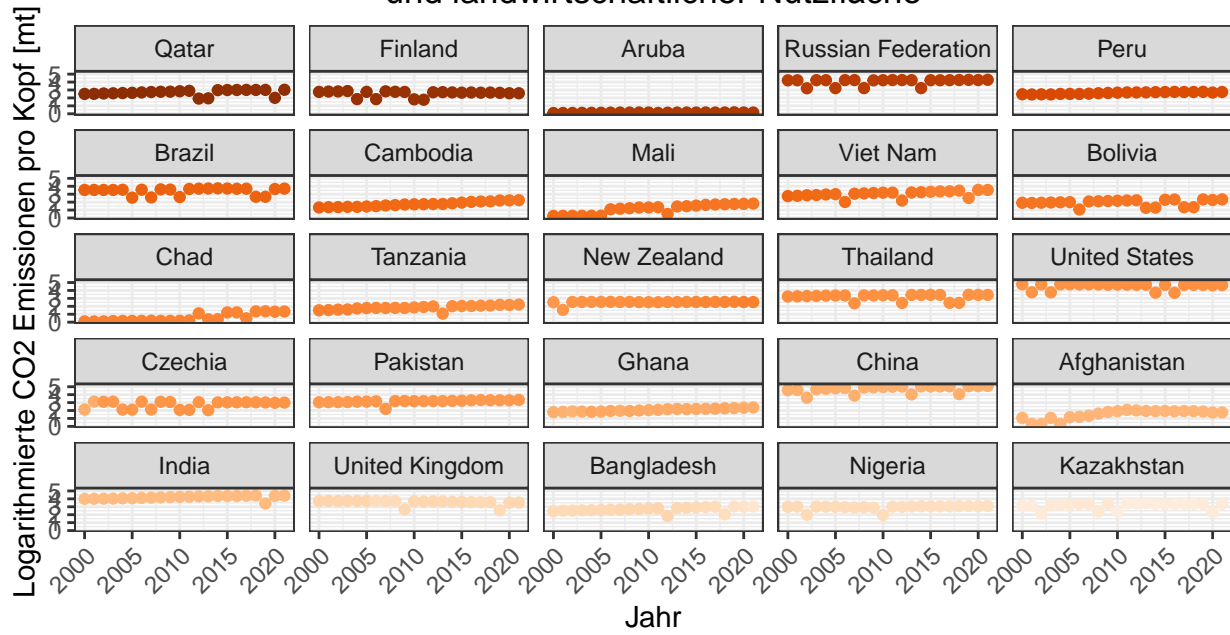
The in ascending percentage of agricultural land sorted facets show no obvious connection between the two indicators, as the CO2 emissions are developing quite arbitrarily regardless of the associated percentage of agricultural land. To dig even further, we now adjust the data by normalizing the CO2 emissions within each country, letting us investigate relative changes on the same scale as the agricultural land.

Zusammenhang zwischen CO2 Emissionen pro Kopf und landwirtschaftlicher Nutzfläche

Landwirtschaftliche Nutzfläche [%]   •   (Min, Max)–normalisierte CO2 Emissionen pro