Climate Change [1990-2018]
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The climate change data-set is taken from worldbank.org which lists many datasets for public use. The data has almost 80 different indicators for almost all the countries. Few of the Indicators are shown in the below picture.

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'Agricultural land (sq. km)', 'Agricultural land (% of land area)',
'Arable land (% of land area)',
'Rural land area where elevation is below 5 meters (sq. km)',
'Rural land area where elevation is below 5 meters (% of total land area)',
'Urban land area where elevation is below 5 meters (sq. km)',
'Urban land area where elevation is below 5 meters (% of total land area)',
'Land area where elevation is below 5 meters (% of total land area)',
'Forest area (sq. km)', 'Forest area (% of land area)',
'Agricultural irrigated land (% of total agricultural land)',
'Average precipitation in depth (mm per year)',
'Cereal yield (kg per hectare)', 'Population growth (annual %)',
'Population, total', 'Urban population growth (annual %)',
'Urban population', 'Urban population (% of total population)',
'Foreign direct investment, net inflows (% of GDP)',
'Ease of doing business rank (1=most business-friendly regulations)',
'CPIA public sector management and institutions cluster average (1=low to 6=high)',
'School enrollment, primary and secondary (gross), gender parity index (GPI)',
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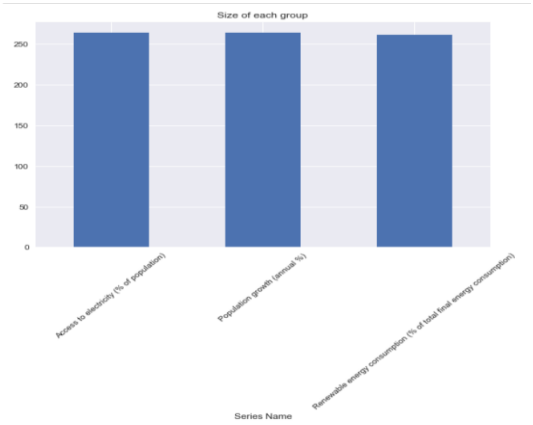
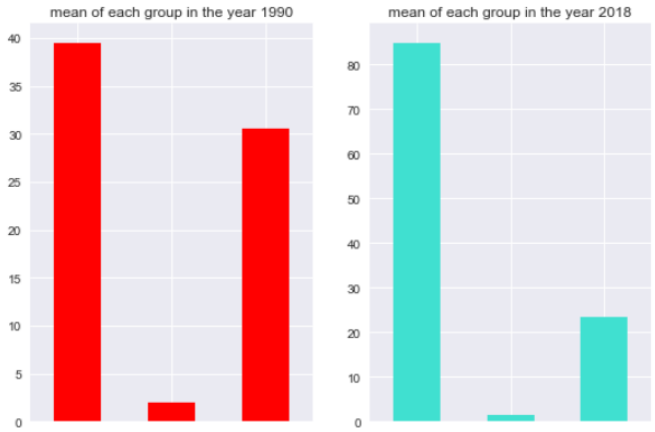
You can find the full data-set here: https://databank.worldbank.org/reports.aspx?source=2&Topic=19
Since it is impossible to summarize all the indicators and analyse in such a short duration we select 3 indicators. **They are**:

- Access to Electricity
- Population Growth
- Renewable Energy Consumption



The plot shows us that there are equal number of observations in all the three indicators. The number of observations is very important, if the data is consistent only then the results can be trusted. Imbalanced data may pose a threat to the accuracy of the results.

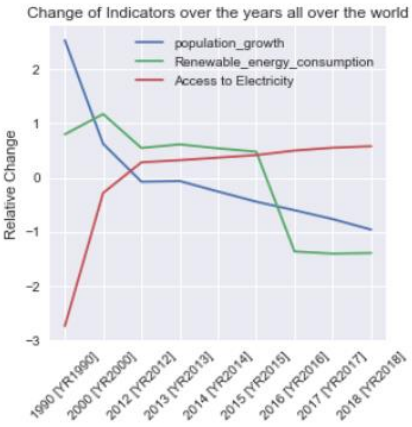
Now we can check how the mean of the indicators have changed over time through the below plot.



The x axis is the same as the above plot. If we observe the y axis in the red and green plots, we can see that the range of y axis for the green plot is higher which indicates there is a definite increase in access to electricity all over the world. But the other two indicators relatively same. This can be true given the rapid modernization and urbanization in the new millennium.

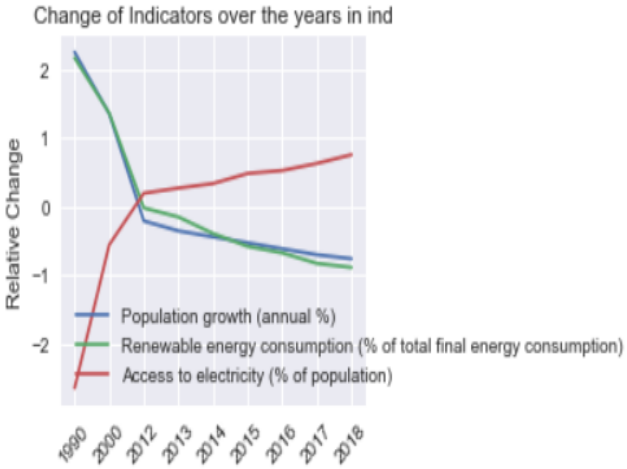
The graph shows us the trend of the three indicators over the course of 1990 to 2018. It is very apparent that “Access too electricity” has increased overtime and remained almost steady while the other two seem to be decreasing. This graph is for the whole world, so, it might not be the case in every country. To compare the results we can check the same graphs of two other countries - developed (USA) and developing (India).

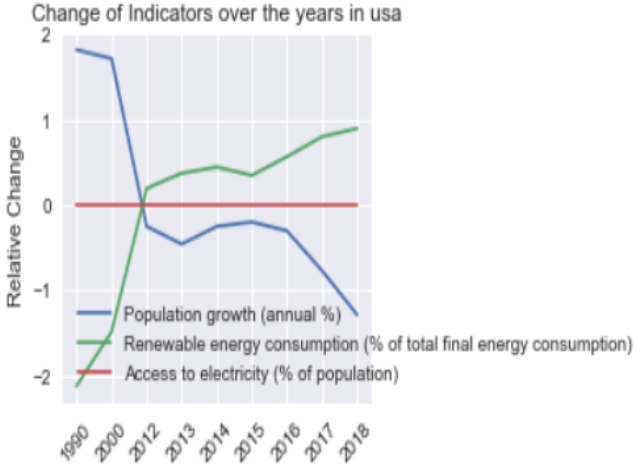
The below graphs show us the clear difference in the three indicators in both countries.

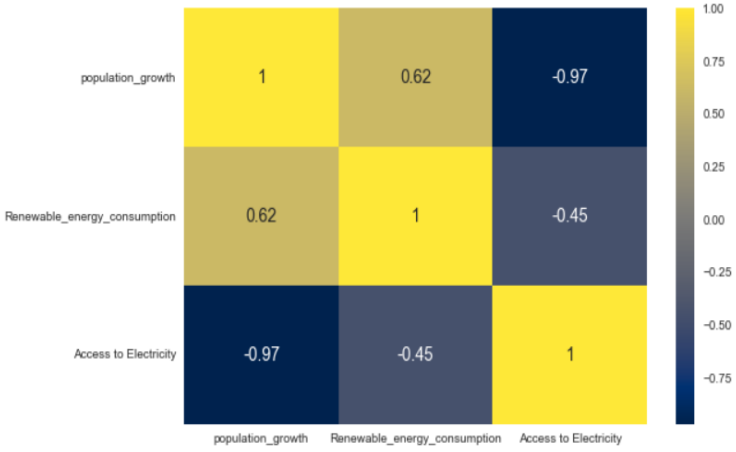


1. **Access to Electricity**: the access to electricity is always stable since many decades, while in India it’s been steadily increasing with just like all over the world.
2. **Renewable energy Consumption**: This is an interesting indicator as it shows that in developing country the consumption of renewable electricity is increasing steadily while in the developing country it’s decreasing steadily.
3. **Population Growth**: In both the countries the population growth is decreasing along with the rest of the world.

All over the world if we check there is a very high negative correlation among Access to Electricity and population growth, a medium negative correlation with renewable energy consumption and access to electricity and a fairly strong positive correlation between renewable energy consumption and population growth.







This means that the as population is growing more and more people are turning to renewable energy and at the same time many people are also not having access to electricity. This might be due to the underdeveloped and developing countries which have a hard time battling population growth.