REPORT FOR FORESTQUERY INTO GLOBAL DEFORESTATION, 1990 TO 2016

ForestQuery is on a mission to combat deforestation around the world and to raise awareness about this topic and its impact on the environment. The data analysis team at ForestQuery has obtained data from the World Bank that includes forest area and total land area by country and year from 1990 to 2016, as well as a table of countries and the regions to which they belong.

The data analysis team has used SQL to bring these tables together and to query them in an effort to find areas of concern as well as areas that present an opportunity to learn from successes.

1. **GLOBAL SITUATION**

According to the World Bank, the total forest area of the world was 41,282,694.9 km^2 in 1990. As of 2016, the most recent year for which data was available, that number had fallen to 39,958,245.9 km^2, a loss of 1,324,449 km^2, or 3.2%.

The forest area lost over this time period is slightly more than the entire land area of Peru listed for the year 2016 (which is 1,279,999.98 km^2).

2. **REGIONAL OUTLOOK**

In 2016, the percent of the total land area of the world designated as forest was 31%. The region with the highest relative forestation was Latin America & Caribbean, with 51%, and the region with the lowest relative forestation was Middle East & North Africa, with 2% forestation.

In 1990, the percent of the total land area of the world designated as forest was 33%. The region with the highest relative forestation was America & Caribbean, with 55%, and the region with the lowest relative forestation was Middle East & North Africa, with 2% forestation.

Table 2.1: Percent Forest Area by Region, 1990 & 2016:

Region	1990 Forest Percentage	2016 Forest Percentage
Latin America& Caribbean	51%	46%
Sub-Saharan Africa	31%	29%
East Asia & Pacific	25%	26%
Europe & Central Asia	37%	38%
Middle East & North Africa	1%	2%

North America	35%	36%
South Asia	16%	17%

The only regions of the world that decreased in percent forest area from 1990 to 2016 were Latin America& Caribbean (dropped from 51% to 46%) and Sub-Saharan Africa (31% to 29%). All other regions actually increased in forest area over this time period. However, the drop in forest area in the two aforementioned regions was so large, the percent forest area of the world decreased over this time period from 32% to 31%.

3. **COUNTRY-LEVEL DETAIL**

A. SUCCESS STORIES

There is one particularly bright spot in the data at the country level, China. This country actually increased in forest area from 1990 to 2016 by 527229.06 km^2. It would be interesting to study what has changed in this country over this time to drive this figure in the data higher. The country with the next largest increase in forest area from 1990 to 2016 was the United States, but it only saw an increase of 79200km^2, much lower than the figure for China.

Russian Federation and Canada are of course very large countries in total land area, so when we look at the largest *percent* change in forest area from 1990 to 2016, we aren't surprised to find a much smaller country listed at the top. Iceland increased in forest area by 213.66% from 1990 to 2016.

B. LARGEST CONCERNS

Which countries are seeing deforestation to the largest degree? We can answer this question in two ways. First, we can look at the absolute square kilometer decrease in forest area from 1990 to 2016. The following 3 countries had the largest decrease in forest area over the time period under consideration:

Table 3.1: Top 5 Amount Decrease in Forest Area by Country, 1990 & 2016:

Country	Region	Absolute Forest Area Change
Brazil	Latin America & Caribbean	541510
Indonesia	East Asia & Pacific	282193.98
Myanmar	East Asia & Pacific	107234
Nigeria	Sub-Saharan Africa	106506
Tanzania	Sub-Saharan Africa	102320

The second way to consider which countries are of concern is to analyze the data by percent decrease.

Table 3.2: Top 5 Percent Decrease in Forest Area by Country, 1990 & 2016:

Country	Region	Pct Forest Area Change
Togo	Sub-Saharan Africa	-75.44 %
Nigeria	Sub-Saharan Africa	-61.79 %
Uganda	Sub-Saharan Africa	-59.12 %
Mauritania	Sub-Saharan Africa	-46.74 %

When we consider countries that decreased in forest area percentage the most between 1990 and 2016, we find that four of the top 5 countries on the list are in the region of Sub-Saharan Africa. The countries are Togo, Nigeria, Uganda, and Mauritania. The 5th country on the list is Honduras, which is in the Latin America & Caribbean region.

From the above analysis, we see that Indonesia is the only country that ranks in the top 5 both in terms of absolute square kilometer decrease in forest as well as percent decrease in forest area from 1990 to 2016. Therefore, this country has a significant opportunity ahead to stop the decline and hopefully spearhead remedial efforts.

C. QUARTILES

Table 3.3: Count of Countries Grouped by Forestation Percent Quartiles, 2016:

Quartile	Number of Countries
0% - 25%	85
25% - 50%	73
50% - 75%	38
75% - 100%	9

The largest number of countries in 2016 were found in the first quartile.

There were 9 countries in the top quartile in 2016. These are countries with a very high percentage of their land area designated as forest. The following is a list of countries and their respective forest land, denoted as a percentage.

Table 3.4: Top Quartile Countries, 2016:

Country	Region	Pct Designated as Forest
Suriname	Latin America & Caribbean	98.25%
Micronesia, Fed. Sts.	East Asia & Pacific	91.85%
Gabon	Sub-Saharan Africa	90.03%
Seychelles	Sub-Saharan Africa	88.41%
Palau	East Asia & Pacific	87.60%
American Samoa	East Asia & Pacific	87.50%
Guyana	Latin America & Caribbean	83.90%
Lao PDR	East Asia & Pacific	82.10%
Solomon Islands	East Asia & Pacific	77.86%

4. RECOMMENDATIONS

Deforestation refers to the decrease in forest areas across the world that are lost for other uses such as agricultural croplands, urbanization or mining activities. Greatly accelerated by human activities since 1960, deforestation has been negatively affecting natural ecosystems, biodiversity, and the climate.

As could be expected, the forest area is decreasing all over the world. Accordingly, it is necessary to identify the countries that had a significant decrease and to investigate its reasons. For instance, some countries like Togo, Nigeria, Uganda and in bigger scale, Sub-Saharan Africa had the largest percent of decrease in forest areas in recent years, which we should focus on them over others. On the other hand, we can see that China had the largest forest increase between 1990 to 2016, which the reason of this increase should be used to solve the deforestation problem in other countries.

We should also find the reasons of deforestation in each region.

(One interesting thing about countries with largest decrease is that their income levels are low.)