Report for Forest Query 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 sqkm in 1990. As of 2016, the most recent year for which data was available, that number had fallen to 39,958,245.9 sqkm, a loss of 1,324,449 sqkm, or 3.21% loss of forest land.

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 1279999.9891 sqkm).

2. **REGIONAL OUTLOOK**

In 2016, the percent of the total land area of the world designated as forest was 31.38. The region with the highest relative forestation was Latin America & Caribbean, with 46.16%, and the region with the lowest relative forestation was Middle East & North Africa, with 2.07% forestation.

In 1990, the percent of the total land area of the world designated as forest was 32.42. The region with the highest relative forestation was Latin America & Caribbean, with 51.03%, and the region with the lowest relative forestation was Middle East & North Africa, with 1.78% forestation.

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

Region	1990 Forest Percentage	2016 Forest Percentage
Latin America & Caribbean	51.02998	46.162072
Europe & Central Asia	37.28394	38.04142
North America	35.65118	36.03936
Sub-Saharan Africa	30.67415	28.78819
East Asia & Pacific	25.77610	26.35868
South Asia	16.51077	17.50586
Middle East & North Africa	1.77524	2.068265
World	32.4222	31.37569

The only regions of the world that decreased in percent forest area from 1990 to 2016 were Latin America & Caribbean (dropped from 51.03% to 46.16%) and Sub-Saharan Africa (30.67% to 28.79%). 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 32.42% to 31.38%.

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 527,229.06 sqkm. 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 79200 sqkm, much lower than the figure for China.

United States and China 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	-541,510 km2
Indonesia	East Asia & Pacific	-282,193.9843 km2
Myanmar	East Asia & Pacific	-107,234.0039 km2
Nigeria	Sub-Saharan Africa	-106,506.0009 km2
Tanzania	Sub-Saharan Africa	-102,320 km2

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	75.45 %
Nigeria	Sub-Saharan Africa	61.80 %
Uganda	Sub-Saharan Africa	59.13 %
Mauritania	Sub-Saharan Africa	46.75 %
Honduras	Latin America & Caribbean	45.03 %

When we consider countries that decreased in forest area percentage the most between 1990 and 2016, we find that three 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 Nigeria 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
1st	85
2nd	72
3rd	38
4th	9

The largest number of countries in 2016 were found in the 1st 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	98.26
Micronesia, Fed. Sts.	East Asia & Pacific	91.86
Gabon	Sub-Saharan Africa	90.04
Seychelles	Sub-Saharan Africa	88.41

Palau	East Asia & Pacifc	87.61
American Samoa	East Asia & Pacifc	87.50
Guyana	Latin America & Caribbean	83.90
Lao PDR	East Asia & Pacific	82.11
Solomon Islands	East Asia & Pacific	77.86

4. RECOMMENDATIONS

Write out a set of recommendations as an analyst on the ForestQuery team.

- *What have you learned from the World Bank data?*

From the World Bank data, it is evident that the global forest area has decreased significantly from 1990 to 2016, with a total loss of approximately 1.32 million square kilometers, representing a decrease of about 3.21%. The overall percentage of the world designated as forest dropped from 32.42% in 1990 to 31.38% in 2016. Notably, the Latin America & Caribbean and Sub-Saharan Africa regions are the only ones that saw a decline in forest area percentage during this period. Specifically, Latin America & Caribbean's forest area decreased from 51.03% to 46.16%, while Sub-Saharan Africa's dropped from 30.67% to 28.79%.

In contrast, regions such as North America and Europe experienced increases in forest area, contributing positively to global forest statistics. Interestingly, China stood out as a bright spot, having increased its forest area by over 527,229 square kilometers during the same period, highlighting successful reforestation efforts or policy changes. Iceland had the highest percentage increase in forest area at 213.66%, demonstrating that smaller countries can also make significant gains.

- *Which countries should we focus on over others?*

Focus should be directed toward countries experiencing significant declines in forest area, particularly Nigeria, which ranks high in both absolute decrease in square kilometers and percentage loss. Given that Nigeria is facing severe forest loss, it presents a critical opportunity for conservation and restoration efforts. Other countries in Sub-Saharan Africa, such as Togo and Uganda, along with Honduras from the Latin America & Caribbean region, should also be prioritized for intervention to halt the decline in forest areas.

Additionally, it is essential to examine the successful cases like China and Iceland to understand what strategies led to their increases in forest area. Learning from these successes could help inform policies and initiatives aimed at reversing deforestation trends in other countries.