

SQL Queries For Deforestation Exploration Project

Create Forestation view

```
DROP VIEW IF EXISTS forestation;

CREATE VIEW forestation
AS
    (SELECT f.country_code,
           f.country_name
    AS
        country,
        f.year,
        r.region,
        ( l.total_area_sq_mi * 2.59 )
    AS
        total_area_sqkm,
        f.forest_area_sqkm,
        ( f.forest_area_sqkm / ( l.total_area_sq_mi * 2.59 ) ) * 100
    AS
        percent_forest_area
    FROM forest_area AS f
    JOIN land_area AS l
        ON f.country_code = l.country_code
        AND f.year = l.year
    JOIN regions AS r
        ON f.country_code = r.country_code);
```

Part 1 - GLOBAL SITUATION: SQL Queries Used

- a. What was the total forest area (in sq km) of the world in 1990? Please keep in mind that you can use the country record denoted as "World" in the region table.

```
SELECT country,
       year,
       forest_area_sqkm
FROM forestation
WHERE country = 'World'
AND year = 1990;
```

- b. What was the total forest area (in sq km) of the world in 2016? Please keep in mind that the country record in the table is denoted as “World.”

```
SELECT country,
       year,
       forest_area_sqkm
FROM   forestation
WHERE  country = 'World'
       AND year = 2016;
```

- c. What was the change (in sq km) in the forest area of the world from 1990 to 2016?

```
SELECT (SELECT forest_area_sqkm
        FROM   forestation
        WHERE  country = 'World'
              AND year = 1990) - (SELECT forest_area_sqkm
                                  FROM   forestation
                                  WHERE  country = 'World'
                                  AND year = 2016) AS
diff_forest_area;
```

- d. What was the percent change in forest area of the world between 1990 and 2016?

```
WITH forest_area_1990
  AS (SELECT forest_area_sqkm AS area_1990
      FROM   forestation
      WHERE  country = 'World'
            AND year = 1990),
  forest_area_2016
  AS (SELECT forest_area_sqkm AS area_2016
      FROM   forestation
      WHERE  country = 'World'
            AND year = 2016),
  area_diff
  AS (SELECT ( area_1990 - area_2016 ) AS diff,
            ( area_1990 - area_2016 ) / area_1990 * 100 AS
percent_diff
      FROM   forest_area_1990,
            forest_area_2016)
SELECT diff,
       Round(percent_diff :: NUMERIC, 2)
FROM   area_diff;
```

- e. If you compare the amount of forest area lost between 1990 and 2016, to which country's total area in 2016 is it closest to?

```
SELECT DISTINCT country,
                total_area_sqkm
FROM   forestation
WHERE  total_area_sqkm BETWEEN 1270000 AND 1350000;
```

Part 2 - Regional Outlook

```
WITH
-- forest area percentage in 1990
fap_1990
AS (SELECT region,
           year,
           Round(( SUM(forest_area_sqkm * 100) / SUM(total_area_sqkm)
) ::
           NUMERIC,
           2) AS
           forest_area_percent_1990
FROM   forestation
WHERE  year = 1990
GROUP BY region,
           year
ORDER BY region),
-- forest area percentage in 2016
fap_2016
AS (SELECT region,
           year,
           Round(( SUM(forest_area_sqkm * 100) /
SUM(total_area_sqkm) ) ::
           NUMERIC,
           2) AS
           forest_area_percent_2016
FROM   forestation
WHERE  year = 2016
GROUP BY region,
           year
ORDER BY region)
SELECT f1.region,
       f1.forest_area_percent_1990,
       f2.forest_area_percent_2016,
```

```

        ( f2.forest_area_percent_2016 - f1.forest_area_percent_1990 )
AS
    fap_diff_1990_2016
FROM    fap_1990 AS f1
        join fap_2016 AS f2
            ON f1.region = f2.region
ORDER BY fap_diff_1990_2016;

```

- What was the percent forest of the entire world in 2016? Which region had the HIGHEST percent forest in 2016, and which had the LOWEST, to 2 decimal places?
Used above query and change ORDER BY as f2.forest_area_percent_2016
- What was the percent forest of the entire world in 1990? Which region had the HIGHEST percent forest in 1990, and which had the LOWEST, to 2 decimal places?
Used above query and change ORDER BY as f1.forest_area_percent_1990
- Based on the table you created, which regions of the world DECREASED in forest areas from 1990 to 2016?
Use the above query as it is.

Part - 3 Country Level Details

A Success Story

- Which 5 countries saw the largest amount decrease in forest area from 1990 to 2016? What was the difference in forest area for each?

Top 5 Forest area increase as country level

```

WITH country_1990 AS
(
    SELECT country,
           year,
           region,
           forest_area_sqkm
    FROM    forestation
    WHERE   year = 1990
    AND     country IS NOT NULL), country_2016 AS
(
    SELECT country,

```

```

        year,
        region,
        forest_area_sqkm
FROM   forestation
WHERE  year = 2016
AND    country IS NOT NULL)
SELECT  c1.country,
        c1.region,
        c1.forest_area_sqkm                               AS fa_1990,
        c2.forest_area_sqkm                               AS fa_2016,
        ( c2.forest_area_sqkm - c1.forest_area_sqkm ) AS diff_fa
FROM    country_1990                                     AS c1
JOIN    country_2016                                     AS c2
ON      c1.country = c2.country
WHERE   c1.forest_area_sqkm IS NOT NULL
AND     c2.forest_area_sqkm IS NOT NULL
ORDER BY diff_fa DESC limit 5;

```

Top 5 forest area decrease as country level

```

WITH country_1990 AS
(
    SELECT country,
           year,
           region,
           forest_area_sqkm
    FROM   forestation
    WHERE  year = 1990
    AND    country IS NOT NULL), country_2016 AS
(
    SELECT country,
           year,
           region,
           forest_area_sqkm
    FROM   forestation
    WHERE  year = 2016
    AND    country IS NOT NULL)
SELECT  c1.country,
        c1.region,
        c1.forest_area_sqkm                               AS fa_1990,
        c2.forest_area_sqkm                               AS fa_2016,
        ( c2.forest_area_sqkm - c1.forest_area_sqkm ) AS diff_fa
FROM    country_1990                                     AS c1
JOIN    country_2016                                     AS c2

```

```

ON          c1.country = c2.country
WHERE       c1.forest_area_sqkm IS NOT NULL
AND         c2.forest_area_sqkm IS NOT NULL
ORDER BY    diff_fa limit 5;

```

- b. Which 5 countries saw the largest percent decrease in forest area from 1990 to 2016? What was the percent change to 2 decimal places for each?

Top 5 Largest percent increase in forest area

```

WITH country_1990 AS
(
    SELECT country,
           year,
           region,
           forest_area_sqkm
    FROM   forestation
    WHERE  year = 1990
    AND    country IS NOT NULL
    AND    forest_area_sqkm IS NOT NULL), country_2016 AS
(
    SELECT country,
           year,
           region,
           forest_area_sqkm
    FROM   forestation
    WHERE  year = 2016
    AND    country IS NOT NULL
    AND    forest_area_sqkm IS NOT NULL)
SELECT    c1.country,
           c1.region,
           c1.forest_area_sqkm
AS fa_1990,
           c2.forest_area_sqkm
AS fa_2016,

Round(((c2.forest_area_sqkm-c1.forest_area_sqkm)*100/c1.forest_area_sq
km) :: numeric,2) AS percent_diff_fa
FROM      country_1990
AS c1
JOIN      country_2016
AS c2
ON        c1.country = c2.country
ORDER BY  percent_diff_fa DESC limit 5;

```

Top 5 Largest percent decrease in forest_area

```
WITH country_1990 AS
(
    SELECT country,
           year,
           region,
           forest_area_sqkm
    FROM forestation
    WHERE year = 1990
    AND country IS NOT NULL
    AND forest_area_sqkm IS NOT NULL), country_2016 AS
(
    SELECT country,
           year,
           region,
           forest_area_sqkm
    FROM forestation
    WHERE year = 2016
    AND country IS NOT NULL
    AND forest_area_sqkm IS NOT NULL)
SELECT c1.country,
       c1.region,
       c1.forest_area_sqkm
AS fa_1990,
       c2.forest_area_sqkm
AS fa_2016,

Round(((c2.forest_area_sqkm-c1.forest_area_sqkm)*100/c1.forest_area_sq
km) :: numeric,2) AS percent_diff_fa
FROM country_1990
AS c1
JOIN country_2016
AS c2
ON c1.country = c2.country
ORDER BY percent_diff_fa limit 5;
```

Quartiles

- c. If countries were grouped by percent forestation in quartiles, which group had the most countries in it in 2016?

```

WITH t1
  AS (SELECT country,
            CASE
              WHEN percent_forest_area >= 75 THEN 'Quartile
4 (>75%) '
              WHEN percent_forest_area >= 50 THEN 'Quartile
3 (50%-75%) '
              WHEN percent_forest_area >= 25 THEN 'Quartile
2 (25%-50%) '
              ELSE 'Quartile 1 (<25%) '
            END AS quartile
  FROM forestation
  WHERE year = 2016
        AND percent_forest_area IS NOT NULL)
SELECT quartile,
       Count(*) AS countries
FROM t1
GROUP BY quartile
ORDER BY quartile;

```

- d. List all of the countries that were in the 4th quartile (percent forest > 75%) in 2016.

```

SELECT country,
       region,
       Round(percent_forest_area :: NUMERIC, 2) AS pct_fa
FROM forestation
WHERE year = 2016
      AND percent_forest_area > 75
ORDER BY pct_fa DESC;

```

- e. How many countries had a percent forestation higher than the United States in 2016?

```

SELECT Count(*) AS countries
FROM forestation
WHERE percent_forest_area > (SELECT percent_forest_area
                             FROM forestation
                             WHERE country = 'United States'
                                   AND year = 2016);

```