**A. GLOBAL SITUATION**   
*--Create a view “forestation” for developing queries to answer questions in the report.*

DROP VIEW IF EXISTS forestation;   
CREATE VIEW forestation AS  
SELECT la.country\_code country\_code, la.country\_name country,la.year review\_year, la.total\_area\_sq\_mitotal\_land\_area,  
round((la.total\_area\_sq\_mi \* 2.59)::numeric,2) AS land\_area\_sqkm, fa.forest\_area\_sqkm AS forest\_area\_sqkm,  
round((fa.forest\_area\_sqkm /(la.total\_area\_sq\_mi \* 2.59))::decimal,4) \* 100 AS pct\_forest\_designated,  
r.region AS region, r.income\_group AS income\_group  
FROM land\_area la   
JOIN forest\_area fa ON la.country\_code = fa.country\_code AND la.year = fa.year  
JOIN regions r ON r.country\_code = la.country\_code;

*-- This query is to find the total forest area (in sq km) of the world in 1990 and 2016, the change in the forest area (in sq km) over this period, and the percent change in the forest area of the world in the same period.*

SELECT a.country\_name, a.forest\_area\_sqkm forest\_area\_90, b.forest\_area\_sqkm forest\_area\_16, a.forest\_area\_sqkm-b.forest\_area\_sqkm forest\_loss,

round(((a.forest\_area\_sqkm-b.forest\_area\_sqkm)\*100/a.forest\_area\_sqkm )::numeric,2) pct\_forest\_loss

FROM forest\_area a JOIN forest\_area b ON a.country\_name=b.country\_name

WHERE b.year=2016 AND a.year=1990

AND a.country\_name='World'

*--Given the amount of forest area lost between 1990 and 2016, the following query is to find which country’s total area in 2016 is closest to the forest area lost.*

SELECT country,land\_area\_sqkm

FROM forestation  
WHERE review\_year = 2016

ORDER BY Abs(land\_area\_sqkm - Abs((SELECT forest\_area\_sqkm FROM forestation LIMIT 1;

WHERE country = 'World'

AND review\_year = 2016) - (SELECT forest\_area\_sqkm FROM forestation  
WHERE country\_code = 'WLD' AND review\_year=1990)))

**B. REGIONAL OUTLOOK**

*--Create a table that shows the Regions and their percent forest area (sum of forest area divided by sum of land area) in 1990 and 2016. This table will be used in all the queries in solving the Regional Outlook questions.*

WITH region\_tbl AS (SELECT region, review\_year,

round((sum(forest\_area\_sqkm)/sum(land\_area\_sqkm)\*100)::numeric,2) AS pct\_forest\_area

FROM forestation  
WHERE review\_year IN (1990,2016) GROUP BY 1,2)

*--Find the percent of the total land area of the world designated in 2016*

SELECT pct\_forest\_area AS percent\_forest FROM region\_tbl  
WHERE region = 'World'  
AND review\_year = 2016

*--To find which region had the HIGHEST percent forest in 2016, and which the LOWEST, to 2 decimal places.*

SELECT region, Max(pct\_forest\_area) AS highest\_pct\_forest

FROM region\_tbl

WHERE review\_year = 2016

GROUP BY 1

ORDER BY 2 DESC

LIMIT 1;

SELECT region, Min(pct\_forest\_area) AS lowest\_pct\_forest

FROM region\_tbl

WHERE review\_year = 2016

GROUP BY 1

ORDER BY 2 DESC

LIMIT 1;

*--Find the percent forest of the entire world in 1990.*

SELECT pct\_forest\_area AS percent\_forest

FROM region\_tbl  
WHERE region = 'World'

AND review\_year = 1990

*--Which region had the HIGHEST percent forestation in 1990, and which had the LOWEST, to 2 decimal places.*

SELECT region, Max(pct\_forest\_area) AS highest\_pct\_forest

FROM region\_tbl

WHERE review\_year = 1990  
GROUP BY 1  
ORDER BY 2 DESC

LIMIT 1;

SELECT region, Min(pct\_forest\_area) AS lowest\_pct\_forest

FROM region\_tbl

WHERE review\_year = 1990  
GROUP BY 1  
ORDER BY 2

LIMIT 1;

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

SELECT region, review\_year, pct\_forest\_area AS percent\_forest

FROM region\_tbl

WHERE region != 'World'

GROUP BY 1,2,3

ORDER BY 1,2

*--c. Based on the table you created, which regions of the world DECREASED in forest area from 1990 to 2016?*

WITH region\_tbl AS (

SELECT region,  
review\_year, round((sum(forest\_area\_sqkm)/sum(land\_area\_sqkm)\*100)::numeric, 2) as pct\_forest\_area  
FROM forestation  
WHERE review\_year IN (1990,2016)  
GROUP BY 1,2),  
t90 AS (SELECT region, pct\_forest\_area

FROM region\_tbl  
WHERE review\_year=1990),

t16 AS (SELECT region, pct\_forest\_area FROM region\_tbl

WHERE review\_year=2016)

SELECT a.region, (b.pct\_forest\_area - a.pct\_forest\_area) AS pct\_chg

FROM t90 a  
JOIN t16 b ON a.region=b.region ORDER BY 2  
LIMIT 2;

**C. COUNTRY-LEVEL DETAIL**

**1.** SUCCESS STORIES

*--To find countries actually increased in forest area from 1990 to 2016:*

WITH t90 AS (

SELECT country, review\_year,

forest\_area\_sqkm,

land\_area\_sqkm FROM forestation

WHERE review\_year=1990  
AND country !='World'  
AND country IS NOT NULL  
AND forest\_area\_sqkm IS NOT NULL),

t16 AS (

SELECT country, review\_year,

forest\_area\_sqkm,

land\_area\_sqkm FROM forestation

WHERE review\_year=2016  
AND country !='World'  
AND country IS NOT NULL  
AND forest\_area\_sqkm IS NOT NULL)

SELECT a.country,

Round((b.forest\_area\_sqkm - a.forest\_area\_sqkm):: numeric,2) AS forest\_area\_change,

Round(((b.forest\_area\_sqkm - a.forest\_area\_sqkm)\*100/a.forest\_area\_sqkm)::numeric,2) AS percent\_area\_change,

b.land\_area\_sqkm

FROM t90 a

JOIN t16 b ON a.country=b.country 1,2,3,4

GROUP BY 1,2,3,4

ORDER BY 2 DESC

LIMIT 5

*--To find countries increased in percent forest area from 1990 to 2016:*

WITH t90 AS (

SELECT country, review\_year,

forest\_area\_sqkm, land\_area\_sqkm FROM forestation

WHERE review\_year=1990  
AND country !='World'  
AND country IS NOT NULL  
AND forest\_area\_sqkm IS NOT NULL),

t16 AS (

SELECT country, review\_year,

forest\_area\_sqkm,

land\_area\_sqkm FROM forestation

WHERE review\_year=2016  
AND country !='World'  
AND country IS NOT NULL  
AND forest\_area\_sqkm IS NOT NULL)

SELECT a.country,  
Round((b.forest\_area\_sqkm - a.forest\_area\_sqkm):: numeric,2) AS forest\_area\_change,

Round(((b.forest\_area\_sqkm - a.forest\_area\_sqkm)\*100/a.forest\_area\_sqkm)::numeric,2) AS percent\_area\_change,

b.land\_area\_sqkm

FROM t90 a  
JOIN t16 b

ON a.country=b.country

GROUP BY 1,2,3,4

ORDER BY 3 DESC

LIMIT 5

**2.** LARGEST CONCERNS

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

WITH t90 AS  
( SELECT country, region, review\_year, forest\_area\_sqkm

FROM forestation

WHERE review\_year=1990  
AND country !='World'  
AND country IS NOT NULL),

,t16 AS (

SELECT country, region, review\_year, forest\_area\_sqkm

FROM forestation

WHERE review\_year=2016  
AND country !='World'  
AND country IS NOT NULL),

top\_deforested AS

( SELECT a.country, a.region,

Round((b.forest\_area\_sqkm - a.forest\_area\_sqkm)::numeric,2) AS area\_change

FROM t90 a  
JOIN t16 b ON a.country=b.country

GROUP BY 1,2,3  
ORDER BY 3

LIMIT 5)

SELECT country, region,

abs(area\_change) AS absolute\_forest\_area\_change

FROM top\_deforested

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

WITH t90 AS (

SELECT country, region,

review\_year,

forest\_area\_sqkm FROM forestation

WHERE review\_year=1990  
AND country !='World'  
AND country IS NOT NULL),

t16 AS (

SELECT country, region, review\_year, forest\_area\_sqkm

FROM forestation

WHERE review\_year=2016  
AND country !='World' AND country IS NOT NULL)

SELECT a.country, a.region,

Round(((b.forest\_area\_sqkm - a.forest\_area\_sqkm)\*100/a.forest\_area\_sqkm)::numeric,2) AS pct\_area\_change

FROM t90 a

JOIN t16 b ON a.country=b.country

GROUP BY 1,2,3  
ORDER BY 3

LIMIT 5

**3.** QUARTILES

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

SELECT distinct(quartile), count(country) over(partition by quartile)

FROM (

SELECT country, pct\_forest\_designated,  
CASE  
WHEN pct\_forest\_designated < 25 THEN '0 - 25%'  
WHEN pct\_forest\_designated BETWEEN 25 AND 50 THEN '25% - 50%'

WHEN pct\_forest\_designated BETWEEN 50 AND 75 THEN '50% - 75%'

ELSE '75% - 100%' END AS quartile

FROM forestation  
WHERE review\_year = 2016

AND country != 'World'  
AND pct\_forest\_designated IS NOT NULL) sub;

*– Table 3.4: Top Quartile Countries, 2016:*

SELECT country, region, pct\_forest\_designated

FROM (

SELECT country, region,

round(pct\_forest\_designated::numeric,2) AS pct\_forest\_designated

FROM forestation  
WHERE review\_year = 2016  
AND pct\_forest\_designated IS NOT NULL

AND pct\_forest\_designated > 75 ) sub

ORDER BY 3 DESC;