An Analysis of World's Forest Cover
Project Plan

Version 1.0

Revision History

Date	Version	Description	Author
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1. Introduction

1.1 Purpose of this document

The purpose of this document is to provide a detailed project description of the application called An Analysis of World's Forest Cover, which is designed to help governments, scientists and citizens understand the world's forest distribution and the indicators that are impacting the forest area. This document includes details about organization, roles, deliverables, project risks, time plans and financial plans.

1.2 Intended Audience

This document shall be used in all phases of the project as a guideline. Intended audiences of this project are all project stakeholders:

- project supervisor
- project leader
- team members

1.3 Scope

This document defines the project plan of 'An analysis of World's Forest Cover' application. The overview includes objectives of the project, organization of the project team, development process that is going to be used during the project, assessment of possible risks, communication used between project stakeholders and project plan that includes time schedule and activity plan.

1.4 Definitions and acronyms

1.4.1 Definitions

Keyword	Definitions
An Analysis of World's Forest Cover	The name of the project
Project Supervisor	A person in charge of supervising the project
Project Leader	A person in charge of organizing the team and communicating with the project supervisor
Team Member	An active member of the team responsible for making the job done
Milestone	A time in a project that marks the end of a project phase or the completion of an important deliverable.
Git	Version control system that will be used in this project
Scrum	An iterative and incremental agile software development method for managing software projects and product or application development
Jira	Web-based tool for integrated agile project management and collaboration based on Scrum
Product owner	Responsible for product management and its quality

1.4.2 Acronyms and abbreviations

Acronym or abbreviation	Definitions
FAO	Forest and Agriculture Organization
ISO Codes	International Organization for Standardization Codes
UNO	United Nations Organization
CSV	Comma Separated Value
ETL	Extract Transform Load

1.5 References

As part of our project management approach, we used a Jira Roadmap to keep track of the deliverables. Since this project is an individual contribution, we only build epics to follow the project track instead of Sprints.

1. http://www.scrum.org/
2. https://www.atlassian.com/software/jira

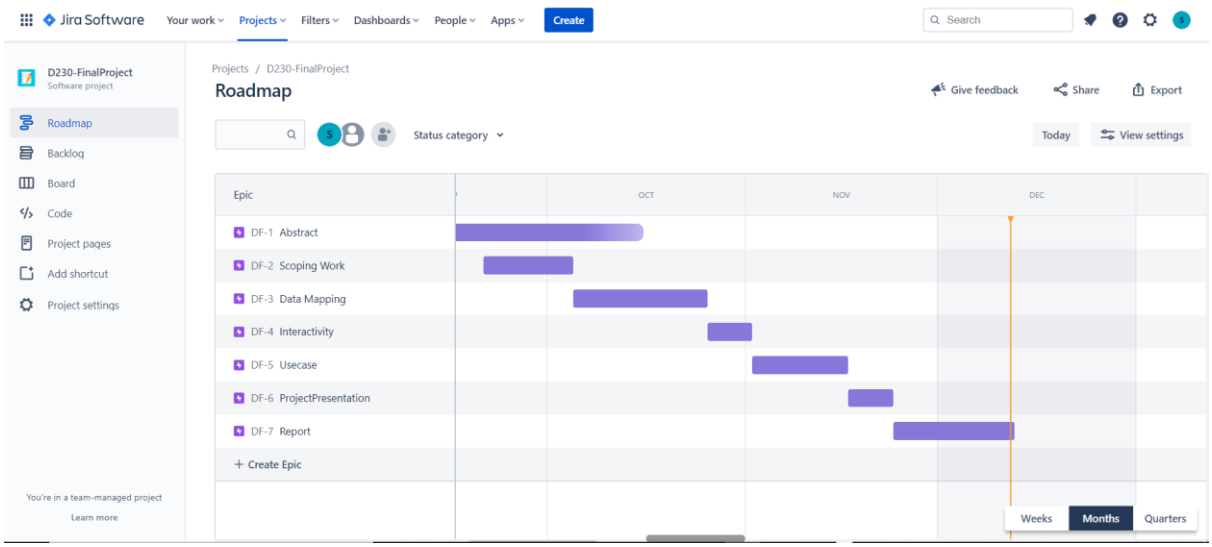

Figure: Project Roadmap on Atlassian's Jira Software

2. Abstract

Deforestation is a serious threat to human and animal ecosystems. The spread of infectious diseases and climate change has been linked to deforestation and is known so for past few decades. Many diseases like Malaria, Ebola have evolved and spread outside their habitat due to the ever-reducing forest cover. Scientists have identified that diseases like SARs, HIV and other novel corona viruses were traced in bats that transmit diseases to other mammals and eventually to human beings. Humans have destroyed their natural habitats by deforestation and are now facing consequences. Forests also capture greenhouse gases and

hence act as natural carbon sinks. Forest cover remains as the best defense in the fight against climate change. In the name of development, humans have been knocking out the wide forest covers which further creates additional carbon emissions from the fallen trees. We should design right policies to achieve economic development without destroying the ecosystem. Apart from these, depleting forest covers have become harmful to the local habitats further damaging the eco system. It is vital to be aware of the extent and consequences to device counter measures and to advocate the adverse effect of deforestation on the environment. To tackle with the ever-disappearing forest land, it is important to keep track of the changes in the forest area. This analysis tries to showcase the extent of forest cover loss across the globe. The data is collected from the UN Food and Agriculture Organization and is presented with interactive visualizations using Tableau to gain insights.

3. Architecture & High-Level Design

As part of our analysis, we have acquired multiple csv files from the Food and Agriculture Organization of the UN. The CSV files are about forest fires, deforestation rate, reforestation rate, land area cover and list of countries with their ISO codes. The files are loaded into the Tableau Prep Builder to perform ETL. Operations like removing unwanted columns, creating derivative fields with mathematical calculations, joining files, and pivoting to transform the year columns as rows are performed as necessary. The files are then joined based on year and country, to form a single CSV file. The Tableau desktop is connected to this cleaned and transformed data to perform analysis and gain insights.

As shown in the figure below, the project follows the below architecture as data flows from multiple CSV files and is transformed as a single CSV input source to the Tableau Desktop for visualizations. As part of ETL we have chosen the Tableau Prep Builder, as our data is of a few thousand rows, and does not require heavy transformations. Tableau prep builder is easier to perform light weight transformations and for simple data cleaning requirements like handling missing values, converting data types, creating new calculated fields etc. With these reasons, we chose the Tableau Prep builder for our ETL.

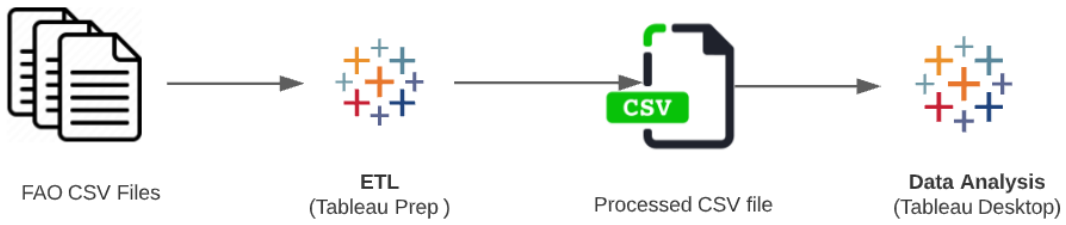

Figure 1: Project Architecture

4. Organization

4.1 Project group

Name	Responsibility (roles)
Sruthi Gatta	Team leader, Individual Contributor

4.2 Customers

The target customers are listed below:

- Professor Andrew Bond
- Section 11, D230
- Government Agencies
- Non-government Organizations
- Media

5. Development process

The project will use the below CSV files downloaded from the Food and Agriculture Organization of the United Nations. FAO is an agency in the United Nations Organization that puts efforts to improve food security, nutrition, and defeat hunger over the world. It was founded in the year 1945 and has been part of creating awareness of new agricultural practices, livestock maintenance, capacity building with minimum resources and digital connectivity. One of the strategic goals of FAO is the sustainability management of world's forests. FAO conducts periodical assessments of forest area, activities in the wild, resources availability and publishes data on their website. This data is used by government, FAO, and other welfare organizations to build projects that help countries develop their sustainable practices.

For this project, we have collected data related to forest assessments from the FAO website. The figures below represent samples of data for the files for Forest Area Change, Forest Area affected by Fire, Annual Reforestation rate, deforestation rate, forest area, land area etc. Each file contains data about each Geographic for the past decade. It is to be noted that, there are missing data for many countries for several years, and hence there is a need to handle such data. Apart from that, the columns for the some of the files have years as field names and it will be difficult to plot time series plots or perform aggregations based on the years. Hence, we used pivoting to transform data as per our requirement. It is identified that, there are certain files that could be joined to present variation among multiple indicators. For example, the reforestation and deforestation rates are of different files, with same years and country names. Hence, we cleaned and joined the two files as one, to make a file that holds the deforestation and reforestation information.

Figure 8 shows the Tableau Prep builder flow that performs ETL on our input raw data files, to provide a clean, transformed data for our analysis. We used, features of Tableau Prep like Filtering, create calculated fields, remove, and rename fields to clean the data. While pivoting and joining to transform the data to get the desired results. Once the pipeline is connected to join files with similar and comparative indicators, the files are also joined with the Country file to obtain country names with the ISO codes presented in FAO files. The country file is joined to get the country name for each country ISO code to improve user readability in our analysis. Once the data is connected, the flow is run to produce multiple csv files and stored in our project folder.

The cleaned and transformed files are loaded in the tableau desktop for our analysis. Using the data blending concept of Tableau, and to avoid multiple data source connections, we connected all the resultant csv files based on their countries to get a unified file for our dashboard. As part of our first dashboard, we will be studying about the land cover usage of various countries and their forest cover. This analysis is needed to understand the extent of deforestation, reforestation rates and the forest fire damage occurring in many countries. This analysis will help us gain insights about the intensity of damages in forest cover due to various factors.

As part of our preliminary analysis, we are comparing the land area to the forest area in thousands of hectares per each continent. The figure shows the comparison of forest covers over the continents and we can see that South America has forest land that covers almost half of its land area.

While the Europe follows South America. Africa's land area and forest area proportion is low when compared to other continents. Figure 10 shows the Countries of Africa in Descending order representing the thousands of hectares of forest habitation.

Our further analysis is to study the countries suffering from Deforestation and forest fires that are depleting the forest cover and in turn need the world's help to regain their forests and help world have an ecological balance and climate conditions. Figure 11 shows the visualization of the devastation caused by forest fires and the depletion of forest area in hectares. The insight gained from this chart is that Brazil in the year 2017, has suffered the most in the entire world in our available data giving as brightest colored bubble showing the extent of damage happened to the forests. The plot shows 143,480 hectares of Brazil's forest land in 2017 alone has perished. This chart shows the fire ravages on each country from years 2000 to 2017 showing us the countries' damage due to forest fire trend. This kind of analysis allows organizations and governments to direct resources, take preventive measures in countries that might be more affected in the future to help build back and safeguard their forests.

As part of our next analysis, we will analyze the other important indicator of reduction in forest cover, Deforestation. To obtain this analysis, we have created a calculated field in the tableau workbook to convert Square Kilometers to Hectares, by multiplying the Value field with 100. Since our entire analysis followed a study of forest land in hectares, we decided to convert this data point to hectares for ease of representation and understanding. This conversion is done for both Deforestation and the Reforestation value fields. This analysis is an interactive map displaying the deforestation occurring in hectares of land in each country for the years 1990 to 2020. Years are the filters in this chart, while the intensity of deforestation is shown as the color showing the hectares damaged. Figure 12 shows the extent of deforestation for the years 2015 to 2020, Brazil has the high intensity of deforestation in the interactive map stating that this country is affected more by the deforestation attempts.

Apart from the factors affecting the forest cover, we should also analyze if any preventive measures are being taken to reduce the exploitation of forests. We also gathered information about the reforestation attempts made in several countries from 1990 to 2020. Figure 13 shows the reforestation in hectares of land occurred in countries around the world in the year 2015 to 2020. The chart is also an interactive chart that represents the reforestation intensity as years go. To understand the extent of efforts being made to reduce the deforestation, we designed an interactive comparison chart for the deforestation and reforestation in hectares with a country filter and period filter. Figure 14 shows the interactive comparison chart, presenting the wide differences in the deforestation and reforestation efforts. This analysis helps governments and organizations to keep track of the fruits of the sustainability efforts and understand the progress of efforts they make over the years.

	A	B	C	D	E
1	Year	1990-2000	2000-2010	2010-2015	2015-2020
2	Afghanistan				
3	Albania (Desk study)				
4	Algeria	14.8	14.5	1.4	5.4
5	American Samoa				
6	Andorra				
7	Angola				
8	Anguilla (Desk study)				
9	Antigua and Barbuda (Desk study)				
10	Argentina	213.6	327.4	242.4	134.8
11	Armenia				
12	Aruba (Desk study)	0	0	0	0
13	Australia	626.2	632.3	416.84	
14	Austria	3.45	7.79	5.8	5.81
15	Azerbaijan			81.64	86.36
16	Bahamas				
17	Bahrain (Desk study)	0.01	0.01	0	0
18	Bangladesh	7.5	3.2	18.19	0
19	Barbados				
20	Belarus	5.8	7.2	4.1	3.5

Figure 2: Forest Area Change

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1		...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which	...of which
2		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
3	Afghanistan																		
4	Albania (Desk study)				0.21	0.02	3.24	1.08	5.87	0.4	0.06	1.13	1.8	3.3					
5	Algeria				5.44	7.01	14.28	8.61	23.45	10.57	11.77	11	9.04	48.75					
6	American	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	Andorra																		
8	Angola				4931.78	3536.22	3938.79	3635.85	4628.82	4269.15	4128.8	5014.41	4114.37	3828.93					
9	Anguilla (Desk study)																		
10	Antigua and Barbuda (Desk study)																		
11	Argentina	944	976	790	1020	92	225	151	35	110	126	53	58	46	103	157	128	177	551
12	Armenia				0.4	0	0.02	0.3	0.01	0.01	0.01	0.78	0.42	0.17					
13	Aruba (Desk study)																		
14	Australia							11279.77	8272.88	7309.5	10275.82	3221.23	26075.96	26682.46	15179.94	20946.27	14774.38		
15	Austria			0.09	0.11	0.01	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.06	0.04	0.09	0.02	0.02
16	Azerbaijan																		
17	Bahamas	0.5	3.83	21.15	0.2	39.43	13.02	3.85	27.23	35.31	8.94	0.52	16.39	15.98	35.31	0.52	0.28	0.5	
18	Bahrain (D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	Bangladesh																		
20	Barbados																		

Figure 3: Forest Area Affected by Fire

	A	B	C	D	E
1	YearChange	1990-2000	2000-2010	2010-2015	2015-2020
2	Afghanistan		0.55	0.55	0.55
3	Albania (Desk study)				
4	Algeria	59	219	167	42
5	American Samoa				
6	Andorra		0.01		
7	Angola	0	0	0	0
8	Anguilla (Desk study)				
9	Antigua and Barbuda (Desk study)				
10	Argentina	8	3	6	16.63
11	Armenia				
12	Aruba (Desk study)				
13	Australia		86.41	26.12	
14	Austria	4.1	2.68	3.05	3.6
15	Azerbaijan	2	91	51.3	60
16	Bahamas	0	0	0	0
17	Bahrain (Desk study)				
18	Bangladesh	0	0	0	0
19	Barbados				
20	Belarus	27.55	34.52	29.62	37.24

Figure 4: Annual Reforestation Per Country

	A	B	C	D	E	F	G	H	I	J	
1	GeoAreaCode	GeoAreaName	Indicator	SeriesCode	SeriesDescription	TimePeriod	Value	Time_Detail	Nature	Units	Repo
2	1	World	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2000	31.91499	2000	E	PERCENT	G
3	1	World	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2010	31.52252	2010	E	PERCENT	G
4	1	World	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2015	31.34963	2015	E	PERCENT	G
5	1	World	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2016	31.32217	2016	E	PERCENT	G
6	1	World	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2017	31.26975	2017	E	PERCENT	G
7	1	World	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2018	31.23248	2018	E	PERCENT	G
8	1	World	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2019	31.19349	2019	E	PERCENT	G
9	1	World	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2020	31.15578	2020	E	PERCENT	G
10	2	Africa	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2000	23.76113	2000	E	PERCENT	G
11	2	Africa	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2010	22.6217	2010	E	PERCENT	G
12	2	Africa	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2015	21.96784	2015	E	PERCENT	G
13	2	Africa	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2016	21.83403	2016	E	PERCENT	G
14	2	Africa	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2017	21.70246	2017	E	PERCENT	G
15	2	Africa	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2018	21.57094	2018	E	PERCENT	G
16	2	Africa	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2019	21.43674	2019	E	PERCENT	G
17	2	Africa	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2020	21.30391	2020	E	PERCENT	G
18	4	Afghanistan	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2000	1.85099	2000	C	PERCENT	G
19	4	Afghanistan	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2010	1.85099	2010	C	PERCENT	G
20	4	Afghanistan	15.1.1	AG_LND_FRST	Forest area as a proportion of total land area (%)	2015	1.85099	2015	C	PERCENT	G

Figure 5: Forest Area percentage per land area

	A	B	C	D	E	F	G	H	I	J	K	
1	GeoAreaCod	GeoAreaNam	Indicator	SeriesCode	SeriesDescription	TimePeriod	Value	Time_Detail	Nature	Units	ReportingTyp	Source
2	1	World	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2000	4158239.52221	2000	E	HA_TH	G	FAO, Global Forest Resource
3	1	World	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2010	4106316.94403	2010	E	HA_TH	G	FAO, Global Forest Resource
4	1	World	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2015	4083867.47594	2015	E	HA_TH	G	FAO, Global Forest Resource
5	1	World	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2016	4080603.54219	2016	E	HA_TH	G	FAO, Global Forest Resource
6	1	World	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2017	4073757.1845	2017	E	HA_TH	G	FAO, Global Forest Resource
7	1	World	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2018	4068923.27415	2018	E	HA_TH	G	FAO, Global Forest Resource
8	1	World	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2019	4063843.08	2019	E	HA_TH	G	FAO, Global Forest Resource
9	1	World	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2020	4058930.81	2020	E	HA_TH	G	FAO, Global Forest Resource
10	2	Africa	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2000	710048.848	2000	E	HA_TH	G	FAO, Global Forest Resource
11	2	Africa	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2010	676015.37	2010	E	HA_TH	G	FAO, Global Forest Resource
12	2	Africa	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2015	656482.32	2015	E	HA_TH	G	FAO, Global Forest Resource
13	2	Africa	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2016	652481.38429	2016	E	HA_TH	G	FAO, Global Forest Resource
14	2	Africa	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2017	648548.99	2017	E	HA_TH	G	FAO, Global Forest Resource
15	2	Africa	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2018	644618.828	2018	E	HA_TH	G	FAO, Global Forest Resource
16	2	Africa	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2019	640608.55	2019	E	HA_TH	G	FAO, Global Forest Resource
17	2	Africa	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2020	636638.97	2020	E	HA_TH	G	FAO, Global Forest Resource
18	4	Afghanistan	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2000	1208.44	2000	C	HA_TH	G	FAO, Global Forest Resource
19	4	Afghanistan	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2010	1208.44	2010	C	HA_TH	G	FAO, Global Forest Resource
20	4	Afghanistan	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2015	1208.44	2015	C	HA_TH	G	FAO, Global Forest Resource
21	4	Afghanistan	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2016	1208.44	2016	C	HA_TH	G	FAO, Global Forest Resource
22	4	Afghanistan	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2017	1208.44	2017	C	HA_TH	G	FAO, Global Forest Resource
23	4	Afghanistan	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2018	1208.44	2018	C	HA_TH	G	FAO, Global Forest Resource
24	4	Afghanistan	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2019	1208.44	2019	C	HA_TH	G	FAO, Global Forest Resource
25	4	Afghanistan	15.1.1	AG_LND_FRSTN	Forest area (thousands of hectares)	2020	1208.44	2020	C	HA_TH	G	FAO, Global Forest Resource

Figure 6: Forest Area in Hectares per country over a decade

	A	B	C	D	E	F	G	H	I	J
1	GeoAreaCod	GeoAreaName	Indicator	SeriesCode	SeriesDescription	TimePeriod	Value	Time_Detail	Nature	Units
2	1	World	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2000	13030626.017	2000	E	HA_TH
3	1	World	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2010	13028129.077	2010	E	HA_TH
4	1	World	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2015	13028361.4835	2015	E	HA_TH
5	1	World	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2016	13029360.9469	2016	E	HA_TH
6	1	World	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2017	13029304.2439	2017	E	HA_TH
7	1	World	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2018	13029372.4054	2018	E	HA_TH
8	1	World	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2019	13029372.4054	2019	E	HA_TH
9	1	World	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2020	13029372.4054	2020	E	HA_TH
10	2	Africa	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2000	2989062.7803	2000	E	HA_TH
11	2	Africa	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2010	2989133.7803	2010	E	HA_TH
12	2	Africa	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2015	2989162.8338	2015	E	HA_TH
13	2	Africa	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2016	2989153.6342	2016	E	HA_TH
14	2	Africa	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2017	2989151.0032	2017	E	HA_TH
15	2	Africa	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2018	2989150.9228	2018	E	HA_TH
16	2	Africa	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2019	2989150.9228	2019	E	HA_TH
17	2	Africa	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2020	2989150.9228	2020	E	HA_TH
18	4	Afghanistan	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2000	65286	2000	E	HA_TH
19	4	Afghanistan	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2010	65286	2010	E	HA_TH
20	4	Afghanistan	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2015	65286	2015	E	HA_TH
21	4	Afghanistan	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2016	65286	2016	E	HA_TH
22	4	Afghanistan	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2017	65286	2017	E	HA_TH
23	4	Afghanistan	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2018	65286	2018	E	HA_TH
24	4	Afghanistan	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2019	65286	2019	E	HA_TH
25	4	Afghanistan	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2020	65286	2020	E	HA_TH
26	5	South America	15.1.1	AG_LND_TOTL	Land area (thousands of hectares)	2000	1746552.5	2000	E	HA_TH

Figure 7: Land Area in Hectares Per Country

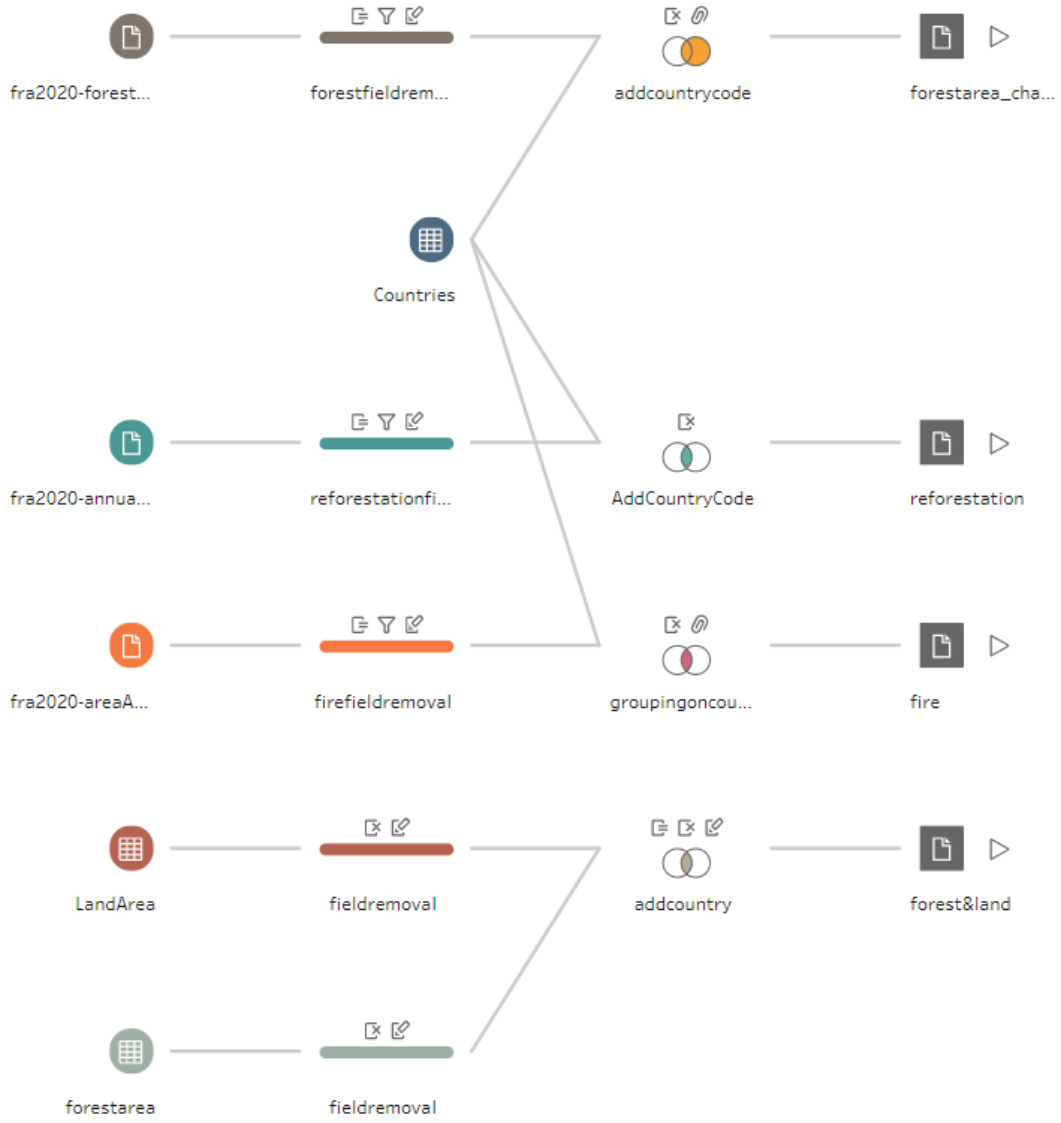

Figure 8: ETL performed in Tableau Prep Builder

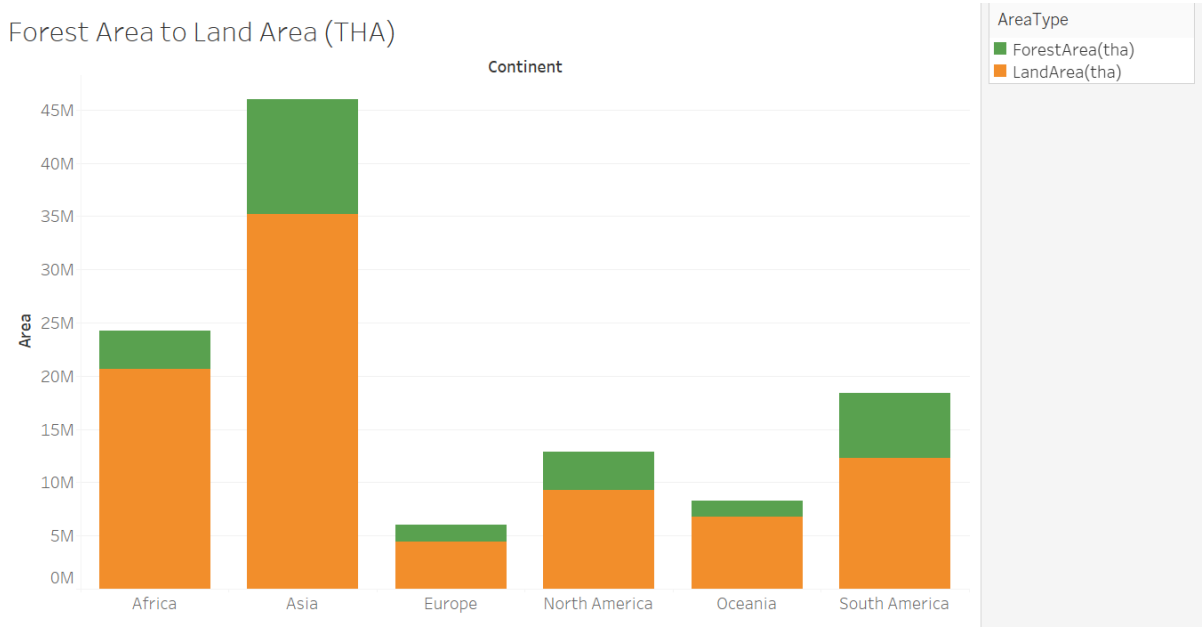

Figure 9: Shows the ratio of Forest Area to Land Area per continent

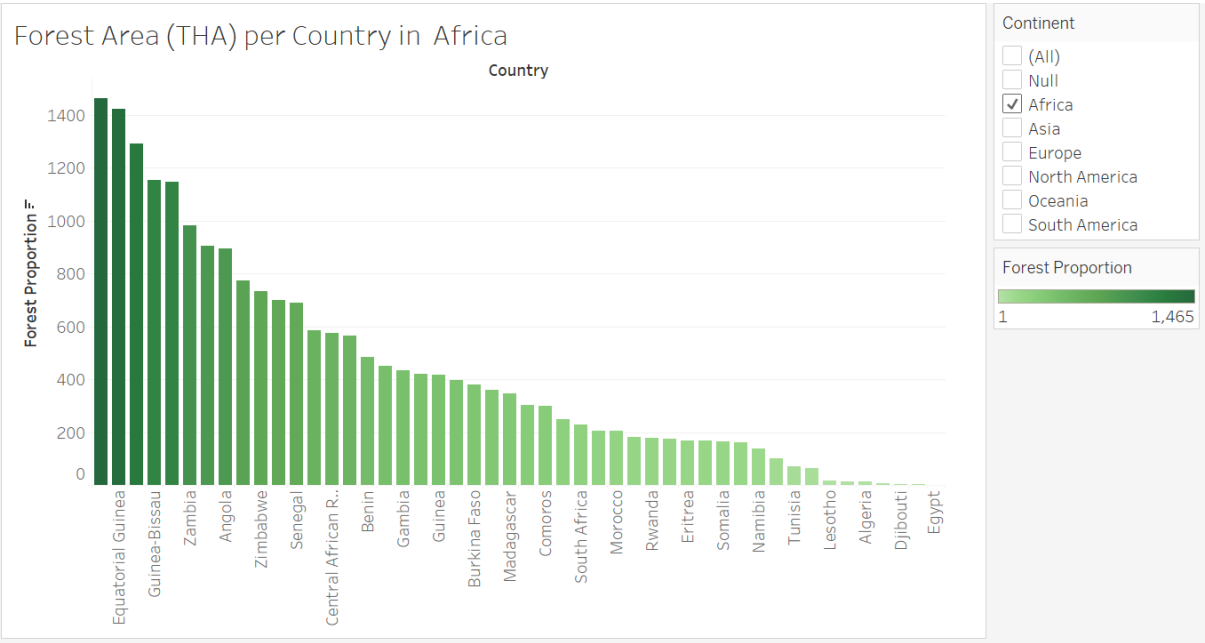

Figure 10: Forest Area per country in Africa presented in Thousands of Hectares

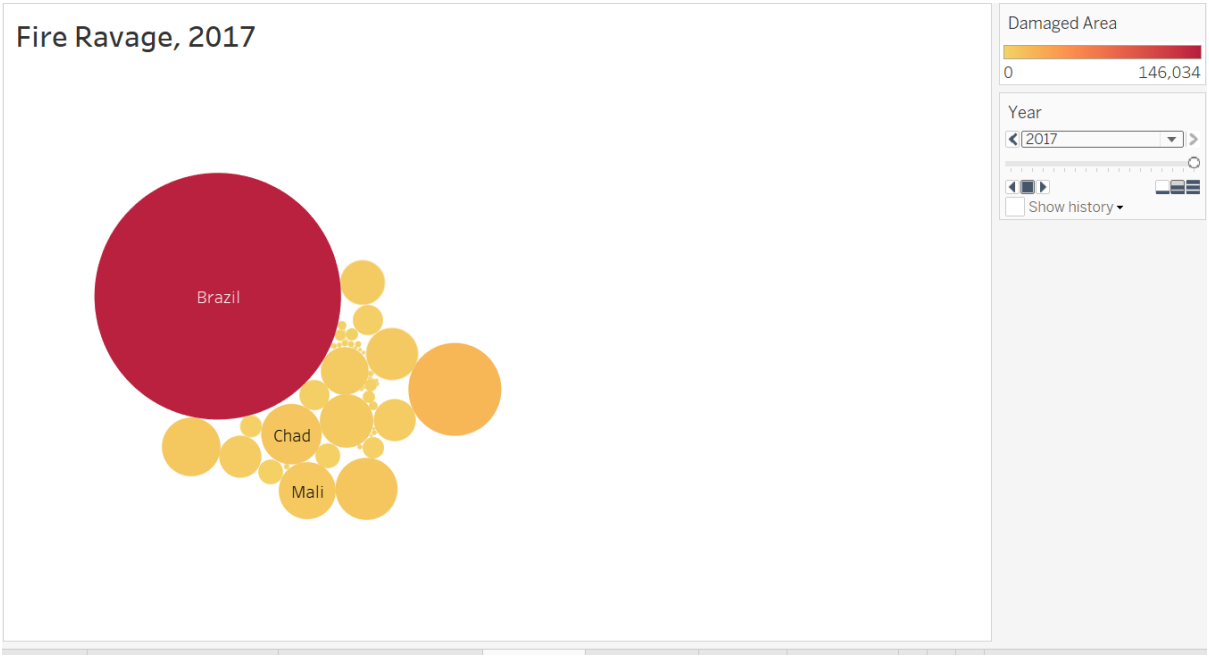

Figure 11. Area of forest area damaged due to Forest Fires in the year 2017 in hectares.

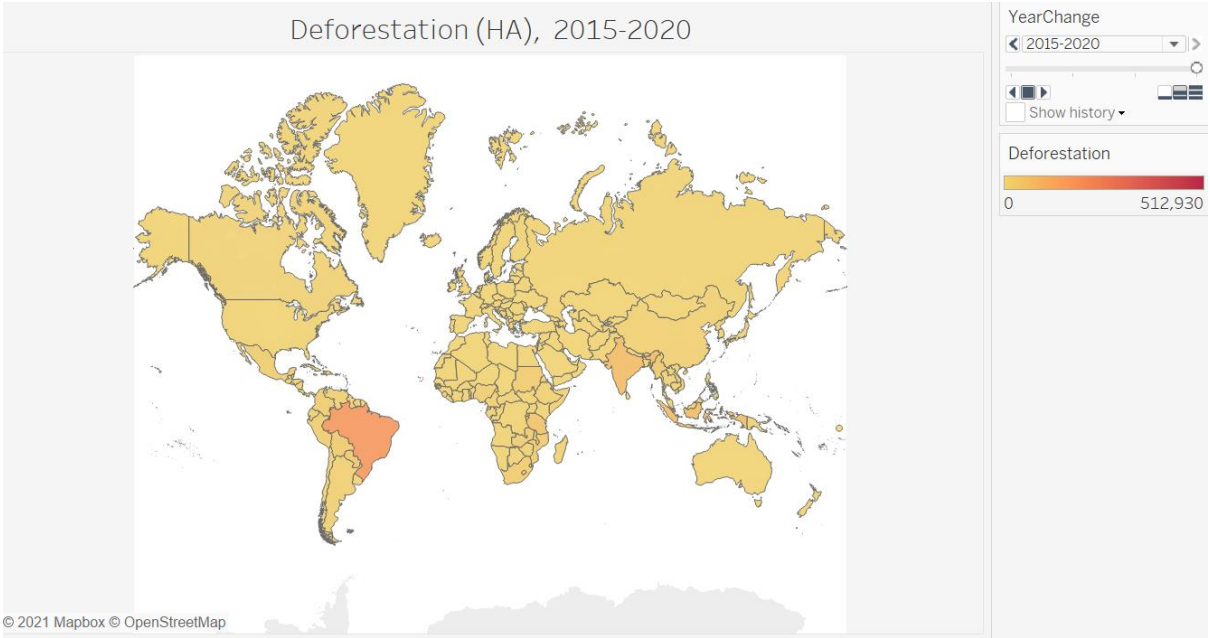

Figure 12: Shows an interactive Map of Deforestation in Hectares for the year 2015-2020.

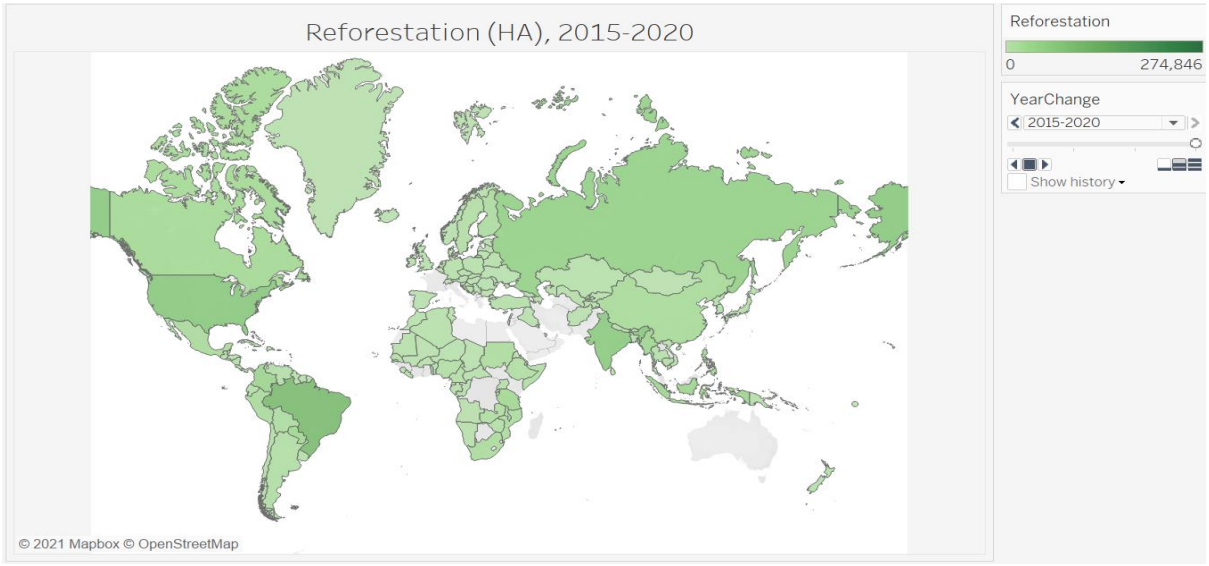

Figure 13: Shows an interactive Map of Reforestation per Hectares in the world for the period of 2015-2020.

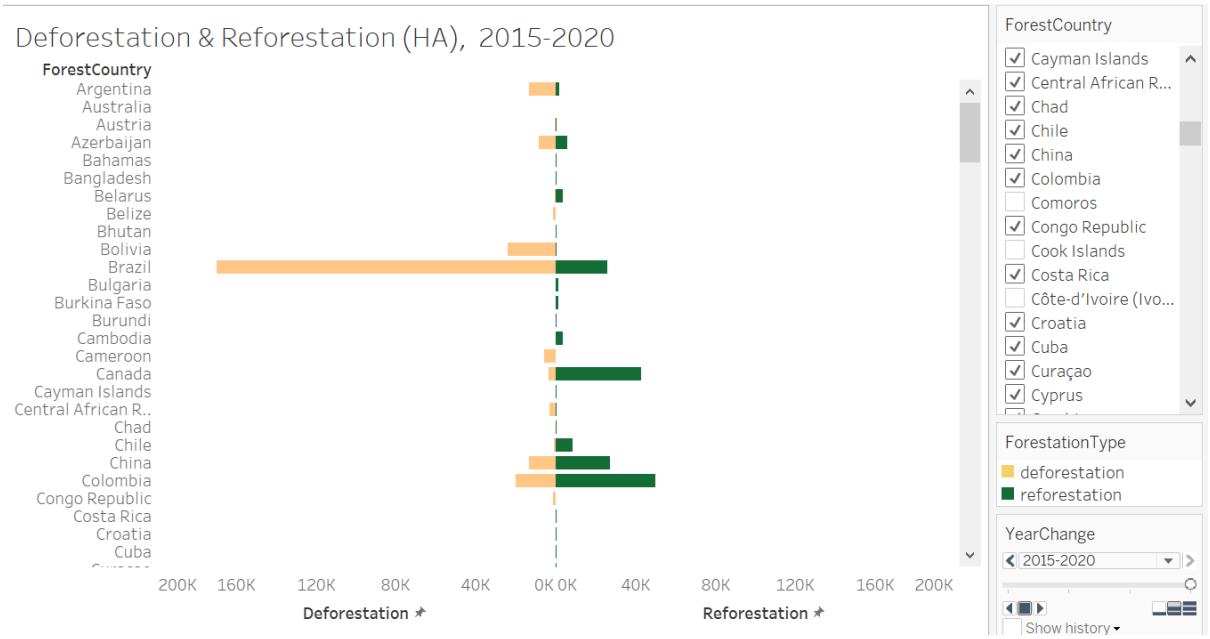

Figure 14: An interactive comparison chart for Deforestation & Reforestation in Hectares for the 2015-2020 period.

6. Deliverables

To	Output	Planned week	Promised week	Late +/-	Delivered week	Notes
Prof Andrew Bond	Abstract	Week 3	Week 3	none	Week 3	A project proposal
Prof Andrew bond, Section 11	Project Presentation	Week 15	Week 15	none	Week 15	Final Project presentation with a demo

Department of Applied Data Science and Prof Andrew Bond	Final Project Report	Week 15	Week 15	none	Week 15	A Report that holds the entire project information
Department of Applied Data Science and Prof Andrew Bond	Project Dashboard	Week 15	Week 15	none	Week 15	A Tableau dashboard that holds the project visualizations

7. Project risks

Possibility	Risk	Preventive action
Loosing data files	High	Back up raw and processed files in Google Drive, GitHub
Tableau Trial ends	High	Save the tableau dashboards as tbw files, extend the trial period

8. Communication

8.1 Collaboration

This project is an individual effort to perform the forest cover analysis using Tableau visualization tool. For various submissions over the semester like Abstract, discussions about possible data requirements, new analyses have happened as an interaction with the professor. Possible improvements were made based on the feedback from professor and better understanding of tools with the knowledge gained from lectures and independent study.

8.2 Git

All source code and finished documentation will be uploaded to a public GitHub repository. The repository will hold the power point presentation for the project, the project report that contains the visualizations and the dataset references.

Repository URL: **https://github.com/Sruthi-Gatta/D230_Tableau**

9. Project plan

9.1 Time schedule

Id	Milestone Description	Responsible Dept./Initials	Finished week			
			Plan	Forecast Week	+/-	Actual
1	Abstract	Sruthi Gatta	Week 1	Week 1		Week 1
2	Scope Of Work	Sruthi Gatta	Week 7	Week 7		Week 7
3	Data Mapping & Interactivity	Sruthi Gatta	Week 10	Week 10	-	Week 10
4	Use Case	Sruthi Gatta	Week 10	Week 10	+2	Week 12

5	Project Presentation	Sruthi Gatta	Week 14	Week 14	-	Week 14
6	Report	Sruthi Gatta	Week 16	Week 15	+1 Week	Week 16

9.1.1 Remarks

Remark Id	Description
1	Additional data gathered for forest fires after scope of work is defined
2	Redid some ETL to fit forest fire data to the final clean data requirement
3	Lost Tableau Online dashboards after trial has expired, hence delay in Usecase deliverables

9.2 Test plan/ Use Case Plan

Test No.	001	**Phase:**	1	**Author:**	<username>	Date:
Test Category:		An Analysis of Brazil forest situation			Sruthi Gatta	11/9/2021
Software Product:		Tableau Desktop				
Test Title:		Brazil Forest Scenario				
Test Purpose:		To understand the				
Test Setup:		Set Country Filter to Brazil				
Prerequisites:		Dashboards available with proper column and field settings				
Procedure:		Select the filter criteria in the Tableau Desktop dashboards				
Checks:		Proper Dashboard setup				
Expected Results:		Graphs showing the Brazil Forest Fire affect, Deforestation and Reforestation in Hectares				
Result:		Brazil has a huge loss in the period 2005-2015 with forest fires, deforestation activities. The intensity on map shows Brazil standing highest in both indicators.				
Reason for Failure:		None				
Remarks:		Brazil tops in Deforestation in 2010, Forest Fire devastation in 2017 is more than 140000 hectares forest area loss, reforestation efforts are on swing since 2105				

Test No.	002	**Phase:**	1	**Author:**	<username>	Date:
Test Category:		Deforestation and Reforestation Comparison for Developed Countries			Sruthi Gatta	11/11/2021
Software Product:		Tableau Desktop				
Test Title:		Deforestation and Reforestation Comparison for Developed Countries				
Test Purpose:		To understand the most developed countries, stand on safeguarding forest cover				
Test Setup:		Select most developed countries from Country filter				
Prerequisites:		Dashboards available with proper column and field settings				
Procedure:		Dashboards available with proper column and field settings				
Checks:		Proper dashboard setup				
Expected Results:		Comparison of the deforestation and Reforestation rates for the most developed countries				
Result:		Out of all the most developed countries, Russian Federation is leading in the Reforestation Efforts covering more than 85000 hectares				
Reason for Failure:		None				
Remarks:		Russian Federation is leading in the Reforestation Efforts covering more than 85000 hectares, while its deforestation is the lowest in all the developed countries at 4000 hectares for the period 2015-2020				

9.2.1 *Testing Remarks*

Remark Id	Description
1	New insights into the forest cover situation of Brazil from 2005 to 2020
2	Identified that most developed countries have started putting more efforts in increasing their forest habitats, Russia standing high among all.

10. References

- https://www.fao.org/faostat/en/#data. [Dataset]
- https://help.tableau.com/current/prep/en-us/prep_about.htm
- https://help.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-home.htm
- https://www.lucidchart.com/pages/
- https://www.atlassian.com/software/jira