WASTE MANAGEMENT

Problem statement:

With over 43,273 miles in area Telangana and its population size of 35.19 million residents there is a need to ensure that human development is not impacting the natural ecosystem of the state. Create a visualization that shows how we can better collect and dispose of waste.

Introduction:

Waste management can be improved by asking the following questions:

1. What is the amount of waste generated?

2. What is the amount of waste collected?

3. What is the amount of waste left after being collected? and what are the key reasons for that?

4. What is the root occurrence of these reasons?

5. What can we do to prevent this from happening?

6. What are the steps taken to improve Waste Management?

Importing Data:

We can use Pandas library to import csv files. Pandas is a software library written for the Python programming language for data manipulation and analysis. In particular, it offers data structures and operations for manipulating numerical tables and time series.

IMPORTING DATA

```
In [19]: import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
data=pd.read_csv("Sanitation.csv")
label=[]
for row in data.ULB:
    label.append(row)
label
data
```

Out[19]:

	ULB	Public Toilets	Community Toilets	She Toilets	ODF Declared Wards	ODF Non Declared Wards	Compost Yard Location & Extent (Acrs)	Dry Resourse Collection Center (Yes/No)	% of Door to Door Collection	Tractors	Autos	Tricycles	Pushcarts	Regular Workers	Out Sourced Workers
0	Adilabad	8.0	NaN	NaN	36	0	36.20	YES	100.0	12	18	5	30	52	200
1	Andol-Jogipet	NaN	NaN	NaN	10	10	3.27	YES	89.0	1	0	12	3	11	37
2	Armoor	4.0	NaN	NaN	23	0	11.09	YES	100.0	5	10	0	0	17	67
3	Atchampet	NaN	NaN	NaN	20	0	0.00	NO	85.0	9	0	5	0	2	74
4	Badangpet	NaN	NaN	NaN	20	0	0.00	YES	100.0	4	30	15	0	0	168
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
67	Vikarabad	3.0	NaN	NaN	28	0	10.01	YES	95.0	3	11	0	0	23	105
68	Wanaparthy	NaN	NaN	NaN	13	13	0.00	NO	84.0	11	0	0	2	17	110

Figure 1:Importing Data

Methods:

I have used data visualization techniques like matplotlib to analyze data

1.Pie chart

2.Line graph

3.Barplot

Analysis:

Finding1:

Highest amount of Garbage is lifted in Khammam with 9.69% is being collected. We can see in the below graph for other ULB's Garbage collection.
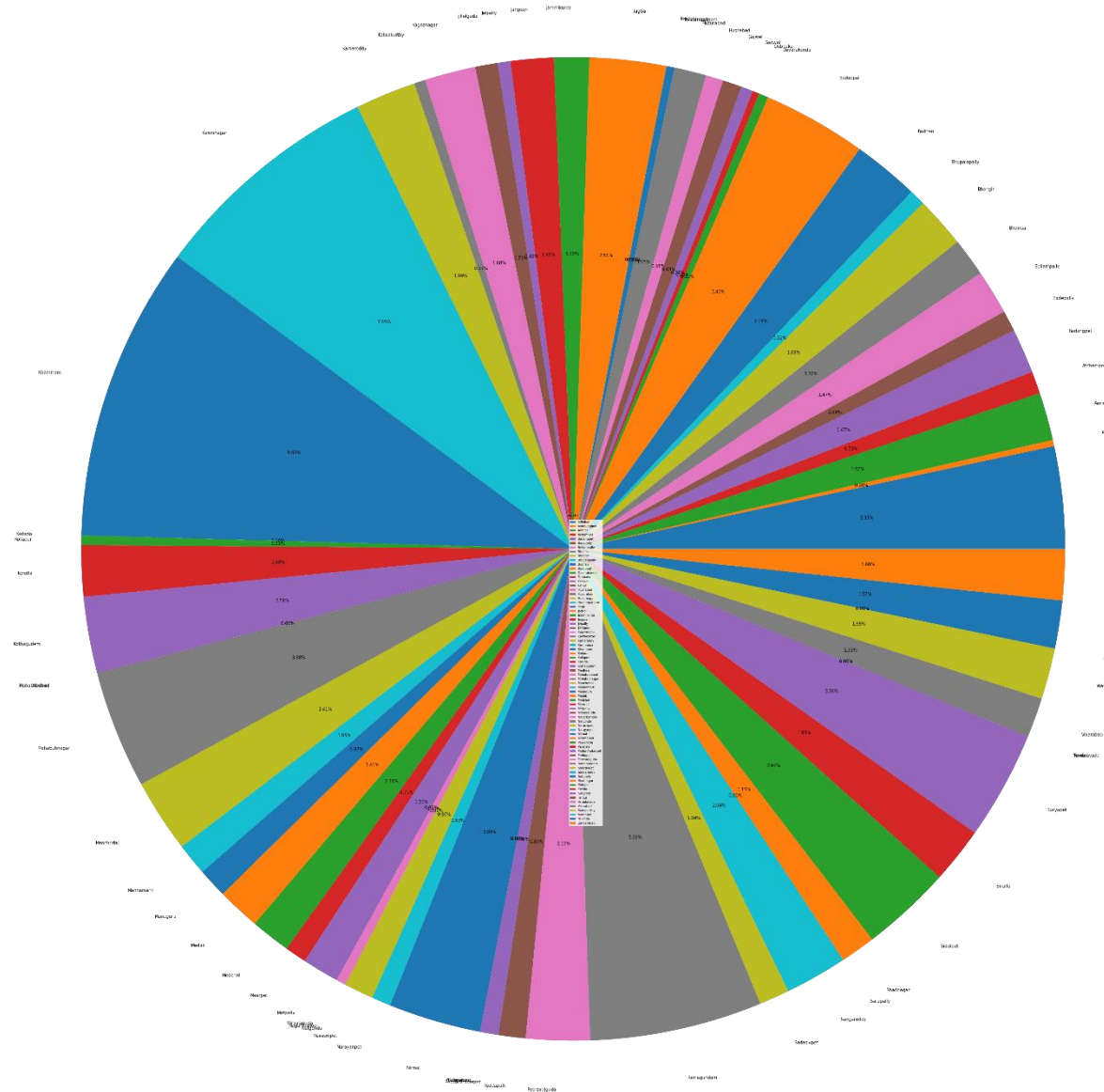

Figure 2: Pie Chart of Garbage Collection.

Finding2:

We can see the sanitation data area plot which indicates the sanitation for particular ULB's. We can see that Garbage is fully lifted in only one ULB (Nirmal). Which says that it has one of the best sanitations strategies.
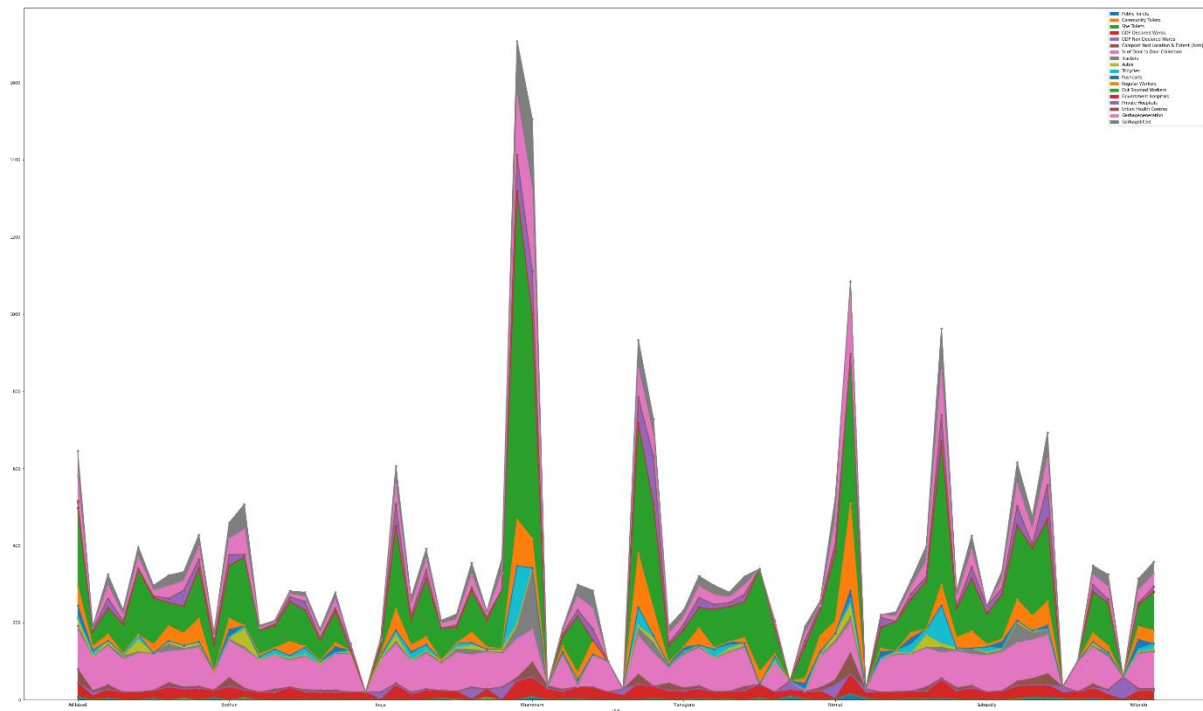

Figure 3: Area plot for the sanitation

Finding3:

We can see that at most 8 ULB's Waste is been collected completely and other ULB's Waste is been not collected completely. Red lines show that the waste is been not collected in specific ULB's.
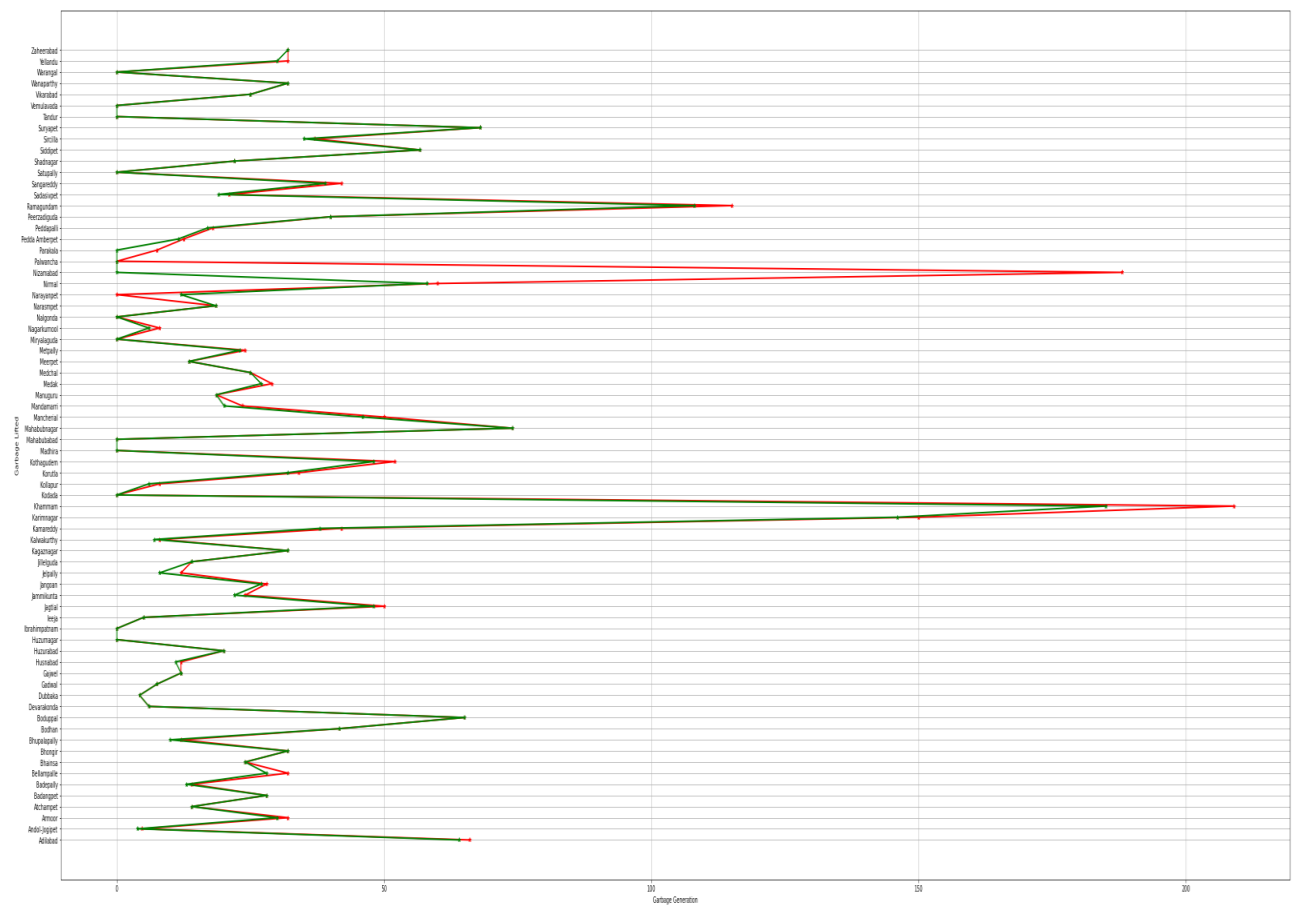

Figure 4: Line plot for Garbage Generation and Garbage Collection

Finding4:

Below Data plot shows the difference in the Garbage generated and Garbage collected. Which can be helpful in finding Specific ULB's which have to improve Waste management system.
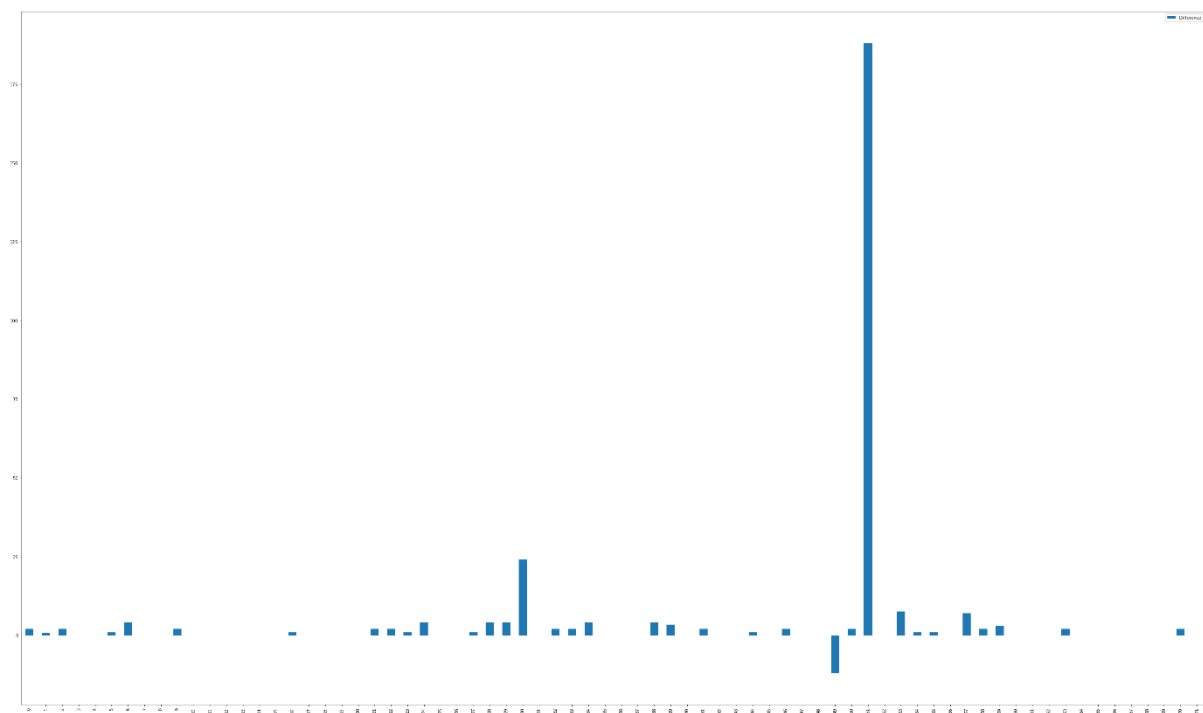

Figure 5: Bar plot for Difference

Conclusion:

Sanitation is one of the key functions of the ULB and the Health Section of ULB is responsible for all sanitation work in the limits of the ULB. Maintenance and upkeep of urban infrastructure such as roads, sewerage drains, preventive measures for control of diseases and epidemics, solid waste management, etc., are some of the key processes which help in maintaining the sanitary conditions of the ULBs. The key processes of Sanitation-Solid Waste Management function involve allocation of employees for sweeping and garbage removal, cleaning of drains, allocation of the vehicles for garbage transportation and disposal of garbage at the dumping ground, maintenance of the vehicles, maintenance of the public toilets, controlling of pigs, dogs and carrying out anti-malarial operations, etc.

Recommendations:

1. We can use door to door collection for efficient waste management.
2. Segregation of waste can be helpful in prevention of harmful gases.
3. Reuse and recycle.
4. We use methods used in Nirmal ULB to improve the Waste Management.