Chennai reservoir water levels and analysis:

In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

In [3]:
```
df1 = pd.read_csv('chennai_reservoir_levels.csv')
df1.head()
```

Out[3]:

	Date	POONDI	CHOLAVARAM	REDHILLS	CHEMBARAMBAKKAM
0	01-01-2004	3.9	0.0	268.0	0.0
1	02-01-2004	3.9	0.0	268.0	0.0
2	03-01-2004	3.9	0.0	267.0	0.0
3	04-01-2004	3.9	0.0	267.0	0.0
4	05-01-2004	3.8	0.0	267.0	0.0

In [34]:
```
df1['Date'] = pd.to_datetime(df1['Date'], format='%d-%m-%Y')
```

In [4]:
```
df1['POONDI'].mean()
```

Out[4]:
```
1115.5625880097596
```

In [6]:
```
df1['REDHILLS'].mean()
```

Out[6]:
```
1543.472891251307
```

In [7]:
```
df1['CHEMBARAMBAKKAM'].mean()
```

Out[7]:
```
1300.4270041826421
```

In [10]:
```
df1['CHOLAVARAM'].mean()
```

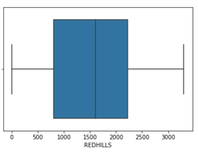
Out[10]:
```
236.21404147786683
```

In [9]:
```
df1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5738 entries, 0 to 5737
Data columns (total 5 columns):
Date              5738 non-null object
POONDI            5738 non-null float64
CHOLAVARAM        5738 non-null float64
REDHILLS          5738 non-null float64
CHEMBARAMBAKKAM   5738 non-null float64
dtypes: float64(4), object(1)
memory usage: 224.2+ KB
```

In [11]:
```
sns.boxplot(df1['REDHILLS'])
```

Out[11]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1a28d119e10>
```

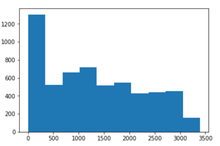


In [15]:
```
df1['REDHILLS'].describe()
```

Out[15]:
```
count    5738.000000
mean     1543.472891
std       904.748504
min         0.000000
25%       804.250000
50%      1605.500000
75%      2223.000000
max      3300.000000
Name: REDHILLS, dtype: float64
```

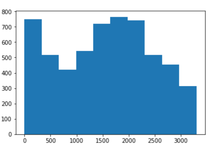
In [29]:
```
plt.hist(df1['CHEMBARAMBAKKAM'])
```

Out[29]:
```
(array([1304.,  523.,  660.,  716.,  515.,  545.,  429.,  437.,  453.,
         156.]),
 array([   0. ,  339.6,  679.2, 1018.8, 1358.4, 1698. , 2037.6, 2377.2,
        2716.8, 3056.4, 3396. ]),
 <a list of 10 Patch objects>)
```



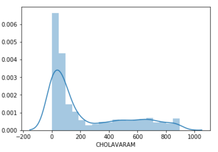
In [30]:
```
plt.hist(df1['REDHILLS'])
```

Out[30]:
```
(array([749., 518., 419., 544., 719., 765., 742., 518., 452., 312.]),
 array([   0.,  330.,  660.,  990., 1320., 1650., 1980., 2310., 2640.,
        2970., 3300.]),
 <a list of 10 Patch objects>)
```



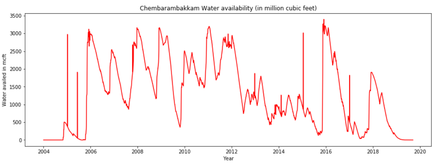
In [31]:
```
sns.distplot(df1['CHOLAVARAM'])
```

Out[31]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1a292bb26a0>
```



In [44]:
```
fig = plt.figure(figsize=(15,5))
plt.plot(df1['Date'], df1['CHEMBARAMBAKKAM'], color='r')
plt.xlabel('Year')
plt.ylabel('Water availed in mcft')
plt.title('Chembarambakkam Water availability (in million cubic feet)')
```

Out[44]:
```
Text(0.5, 1.0, 'Chembarambakkam Water availability (in million cubic feet)')
```



1) From the above graph we can infer that the total availabilty of water in reservoir of chembarambakkam.

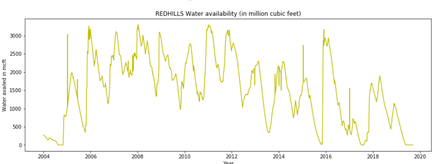
2) We can easily see that the peak value is at the year of 2015-2016 that is it tells about the chennai floods caused at November 2015.

3) Due to floods and heavy rainfall there is increase in amount of water in reservoir reaching its maximum withstanding amount of 3500 mcft

4) At last we can see that by the year of 2018 the level of water starts to decrease and reaching the lowest point by the year of 2019. This area reflects the depletion of water in chennai in year 2019.

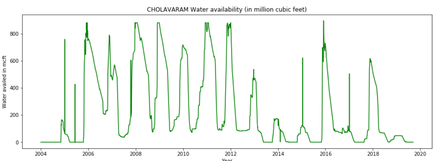
In [45]:
```
fig = plt.figure(figsize=(15,5))
plt.plot(df1['Date'], df1['REDHILLS'], color='y')
plt.xlabel('Year')
plt.ylabel('Water availed in mcft')
plt.title('REDHILLS Water availability (in million cubic feet)')
```

Out[45]:
```
Text(0.5, 1.0, 'REDHILLS Water availability (in million cubic feet)')
```



In [43]:
```
fig = plt.figure(figsize=(15,5))
plt.plot(df1['Date'], df1['CHOLAVARAM'], color='g')
plt.xlabel('Year')
plt.ylabel('Water availed in mcft')
plt.title('CHOLAVARAM Water availability (in million cubic feet)')
```

Out[43]:
```
Text(0.5, 1.0, 'CHOLAVARAM Water availability (in million cubic feet)')
```



Inference:

1) From the above graphs we can infer the reservoir water availability of Redhills and Cholavaram.

2) From the graph we can say that by end of 2018 the water availability in the reservoir reaches the lowest point leading to water scarcity in chennai and inadequate water supply to Chennai.

3) Above 3 grpahs shows the water availbility is at its peak at the end of 2015 on all the 3 reservoirs talking about the Chennai floods.

In [ ]:
```
```