
NGO
Help International

ABOUT THE CASE STUDY

- HELP International is an international humanitarian NGO that is committed to fighting poverty and providing the people of backward countries with basic amenities and relief during the time of disasters and natural calamities. It runs a lot of operational projects from time to time along with advocacy drives to raise awareness as well as for funding purposes.

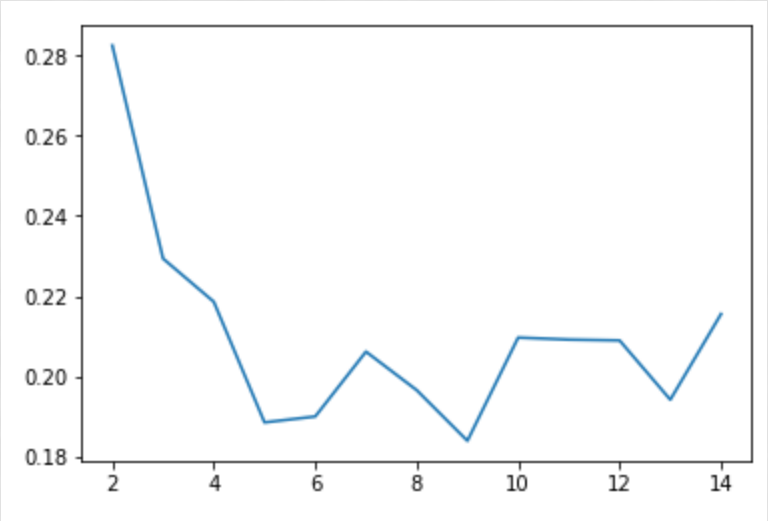
- After the recent project that included a lot of awareness drives and funding programs, they have been able to raise around $ 10 million. Now the CEO of the NGO needs to decide how to use this money strategically and effectively. The significant issues that come while making this decision are mostly related to choosing the countries that are in the direst need of aid.

PROBLEM SOLVING METHODOLOGY

Our problem solving methodology included step by step prosecution of data , as follows:-

- Understanding all the necessary conditions mentioned for the analysis.
- Cleaning of data.
- Performing the various tasks required to be performed , which included silhouette analysis, K—Means clustering , hierarchical clustering , performing pca on the data
- Plotting different graphs required for the analysis.
- Giving the solution of providing funds to the countries , only who are in need .

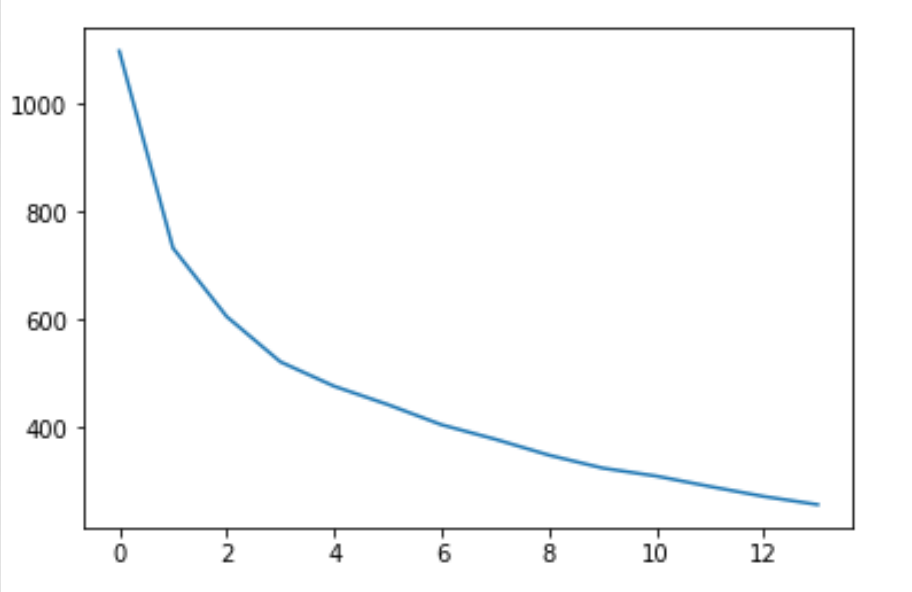
SILHOUETTE ANALYSIS



This graph basically gives us the separation distance between the different clusters formed during analysis.

K-MEANS & HIERARCHICAL CLUSTERING

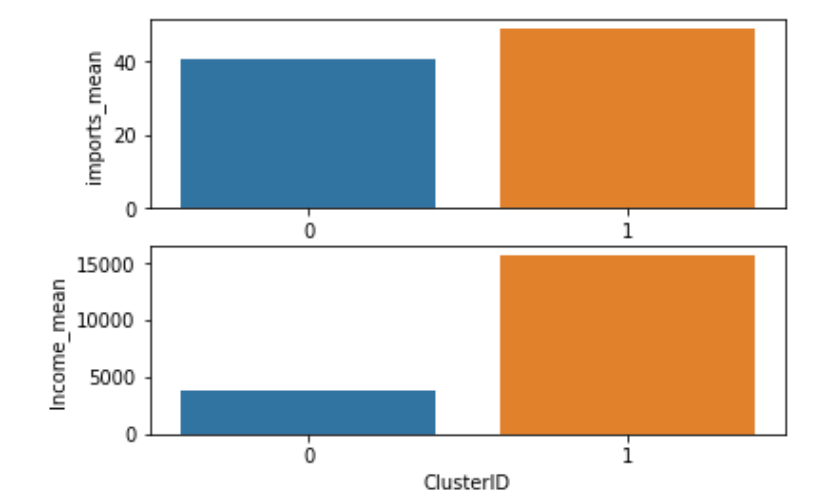
- According to the K-Means clustering elbow bend I got an approx. value of K=2 and formed 2 clusters accordingly.



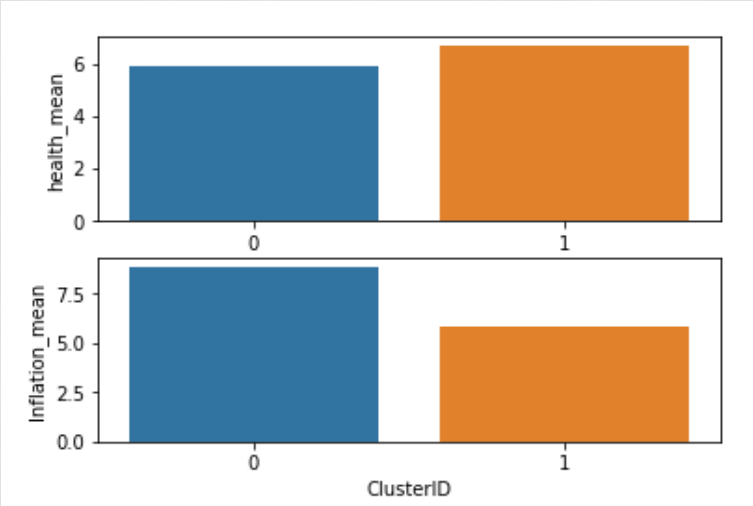
Elbow Curve Graph

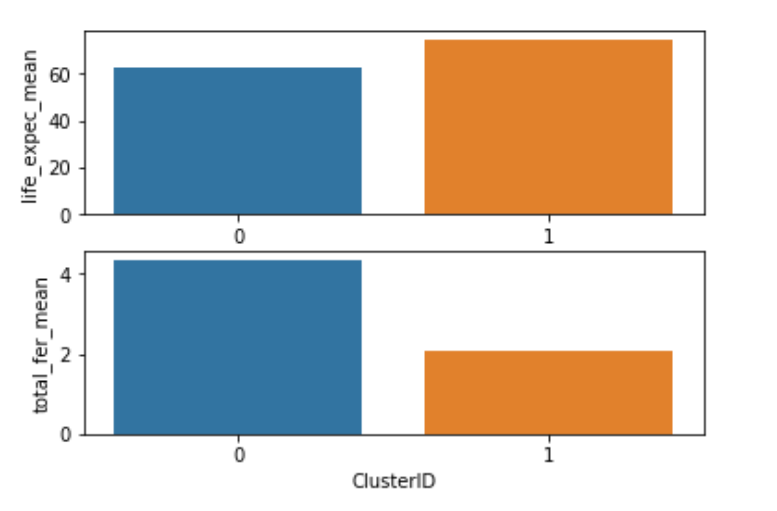
K-MEANS & HIERARCHICAL CLUSTERING

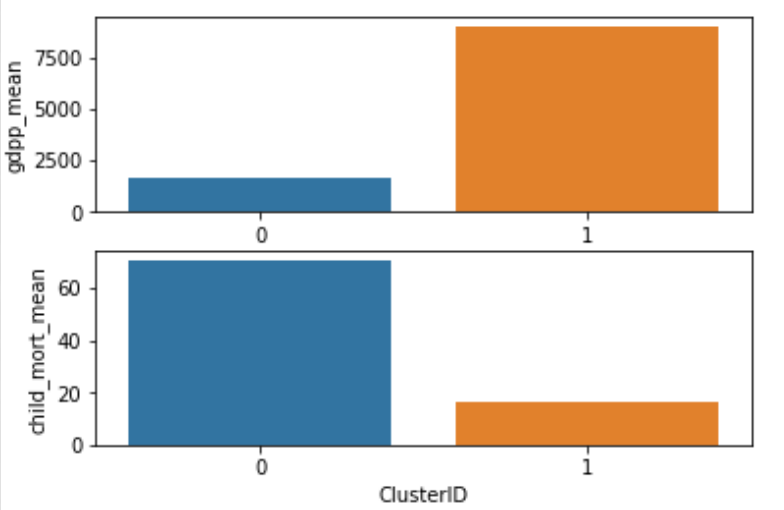
- According to the K-means cluster analysis , Cluster with Cluster id = 0 is in the direst need of aid as the countries in cluster 0 have very high mortality rate, low income, gdpp is lowest, life expectancy is also low and health related factors are also low.
- Hence the countries in cluster 0 , i.e. is coming to be 51 countries ,which are clearly depicted in the python analysis are in direst need of aid.
- Here below I am presenting the various bar plots depicting these factors.



K-MEANS & HIERARCHICAL CLUSTERING

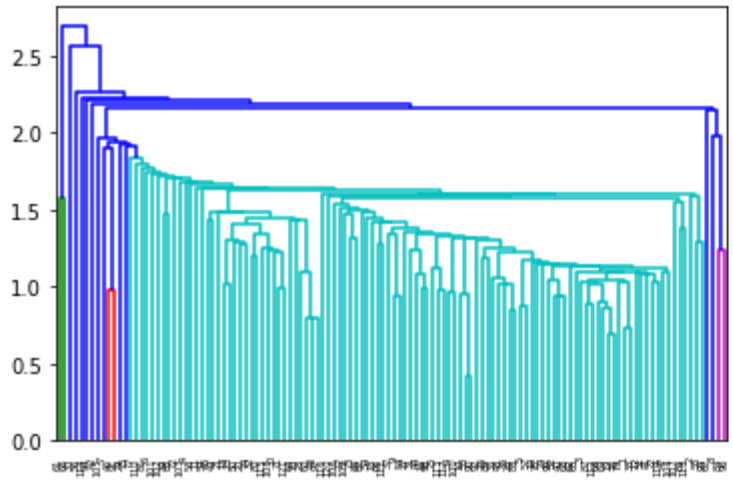






HIERARCHICAL CLUSTERING

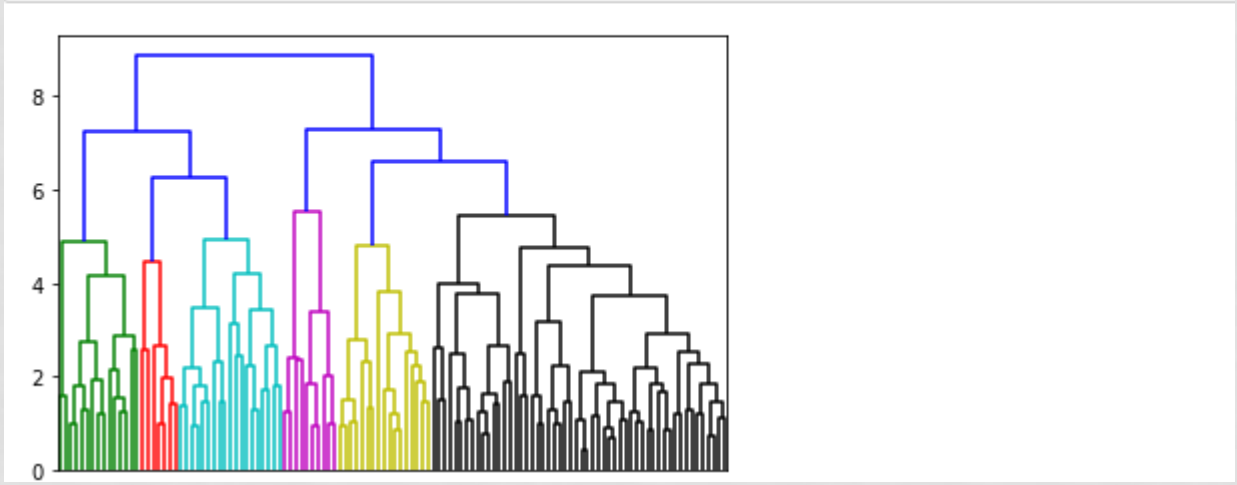
```
# heirarchical clustering
mergings = linkage(dataset_norm1, method = "single", metric='euclidean')
dendrogram(mergings)
plt.show()
```



Hierarchical Clustering using single linkage

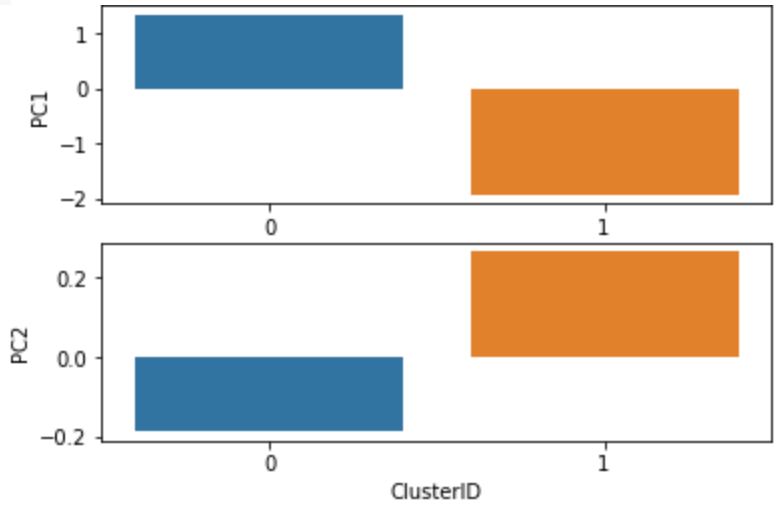
HIERARCHICAL CLUSTERING

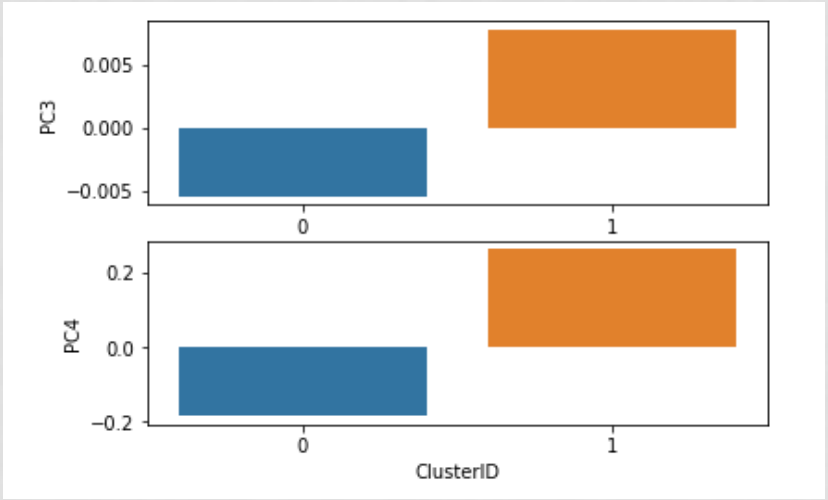
```
mergings = linkage(dataset_norm1, method = "complete", metric='euclidean')
dendrogram(mergings)
plt.show()
```



Hierarchical Clustering using complete linkage

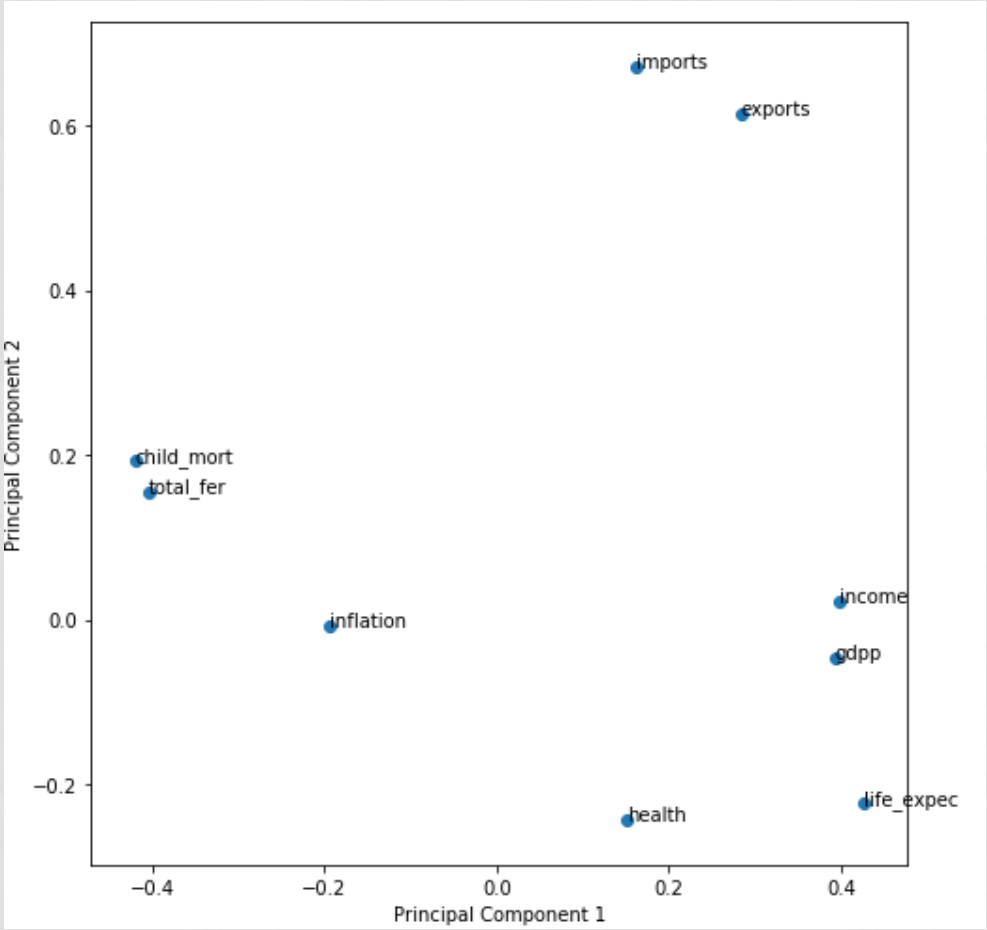
K-MEANS AFTER APPLYING PCA





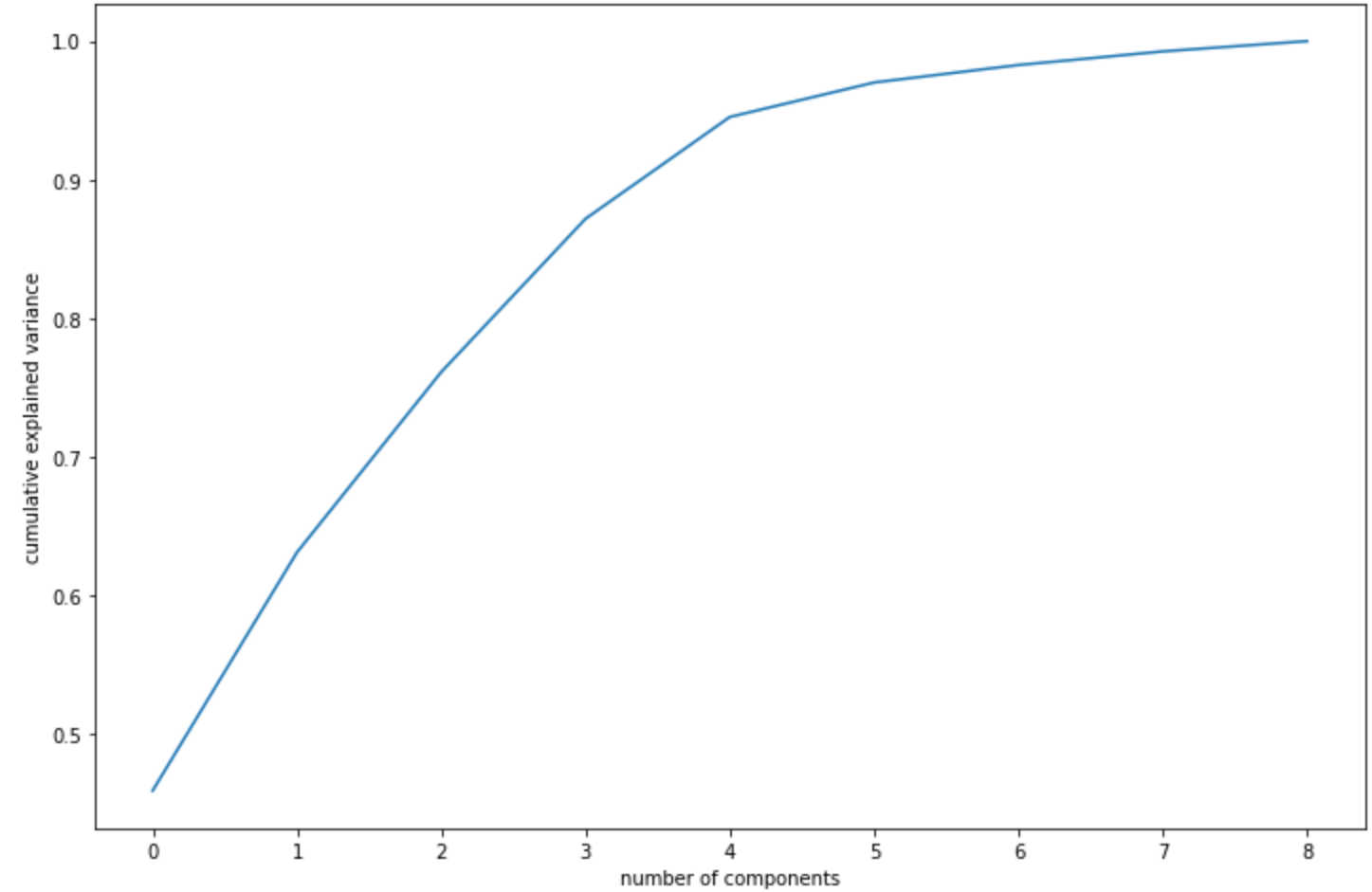
After applying the PCA on the dataset , we get 4 principal components and hence much better analysis.

PCA ANALYSIS RESULTS



Scatter Plot

PCA ANALYSIS RESULTS



Screeplot

CONCLUSION

- Hence from analysis , here is the list of countries which are in dire need of aid.

Afghanistan	0
Bangladesh	0
Benin	0
Bolivia	0
Botswana	0
Burkina Faso	0
Burundi	0
Cambodia	0
Cameroon	0
Comoros	0
Congo, Dem. Rep.	0
Congo, Rep.	0
Cote d'Ivoire	0

37	Egypt	0
39	Eritrea	0
42	Gabon	0
43	Gambia	0
45	Ghana	0
48	Guatemala	0
49	Guinea	0
50	Guinea-Bissau	0
53	India	0
54	Indonesia	0
56	Iraq	0
60	Kenya	0
110	Togo	0
111	Tonga	0
115	Uganda	0
118	Uzbekistan	0
119	Vanuatu	0
121	Zambia	0

60	Kenya	0
61	Kiribati	0
63	Lao	0
66	Liberia	0
70	Madagascar	0
71	Malawi	0
74	Mali	0
75	Mauritania	0
80	Mozambique	0
81	Myanmar	0
82	Namibia	0
83	Nepal	0
85	Pakistan	0
89	Philippines	0
94	Rwanda	0
97	Senegal	0
101	Solomon Islands	0
102	South Africa	0
105	Sudan	0
107	Tajikistan	0
108	Tanzania	0