

HELP

Finding the countries in direst need of aid from
the organization.

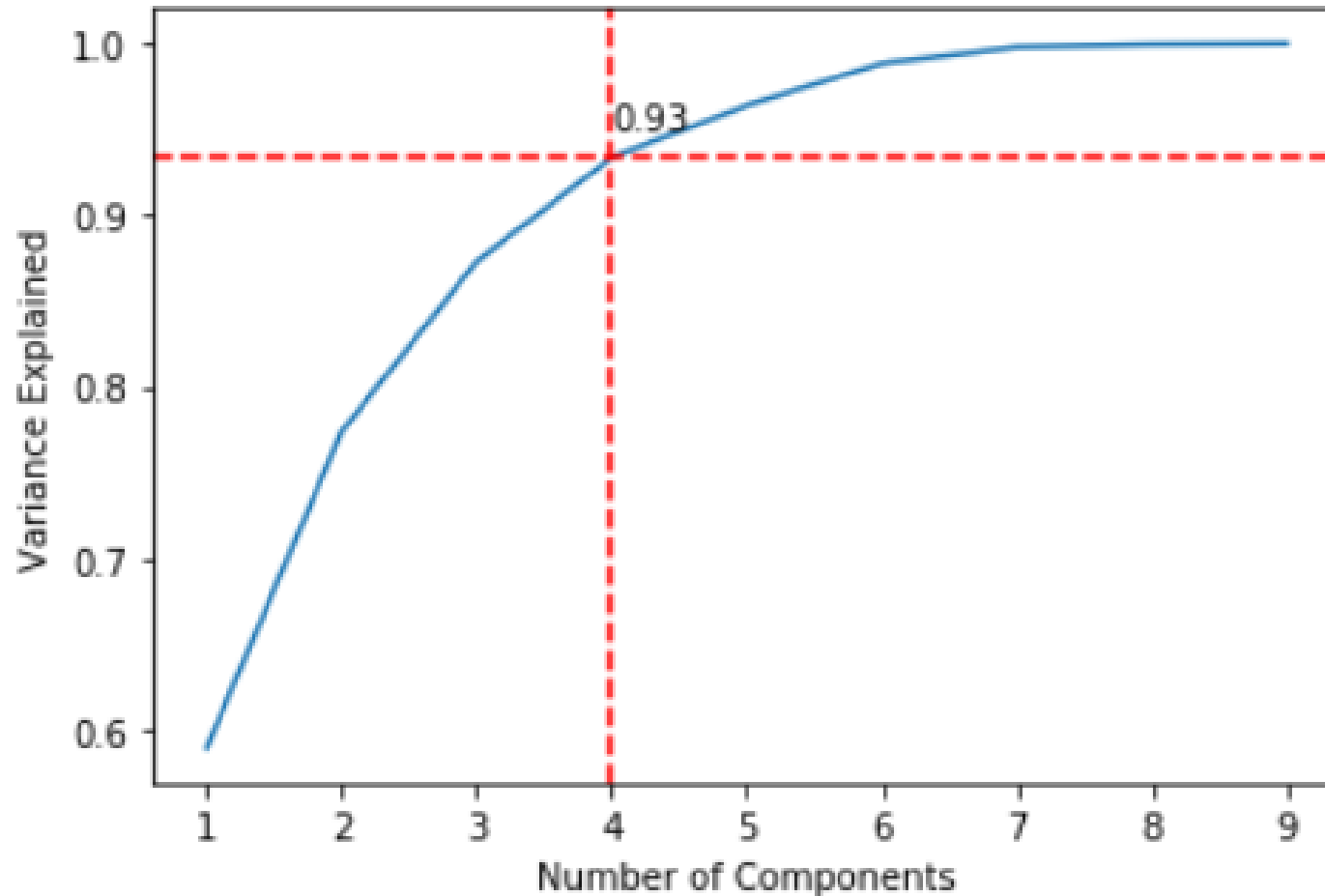
AIM OF THE ANALYSIS

- After the recent funding programmes of HELP International, the company has 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.
- Hence, our analysis aims to find these countries for the CEO to focus on.

ANALYSIS APPROACH

- We first use the Principal Component Analysis (PCA) to find the principal variables (components) affecting the development of the countries.
- We then segment the countries by applying a Clustering Algorithm on the PCA Dataset. The Clustering algorithm aims to cluster our data into K groups (clusters) such that the countries in the same cluster have similar development and the countries in different clusters have dissimilar development.
- After finding the cluster with the least development, we further reduce the number of countries to focus on using the Human Development Index.

PRINCIPAL COMPONENT ANALYSIS- To find the principal components affecting the development of the countries.



Hence, we observe that approximately 93% of the variance is explained by the first four principal components.

CLUSTERING RESULTS

We segment the countries into 3 clusters possessing the following properties:

DEVELOPED COUNTRIES

- Highest per capita GDP
- Highest per capita income
- Lowest Child Mortality Rate

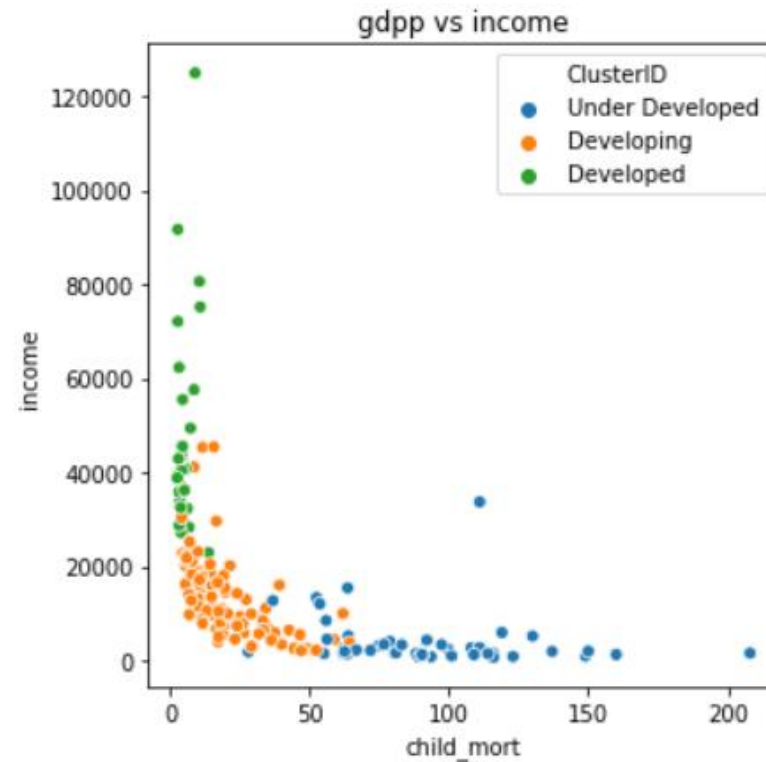
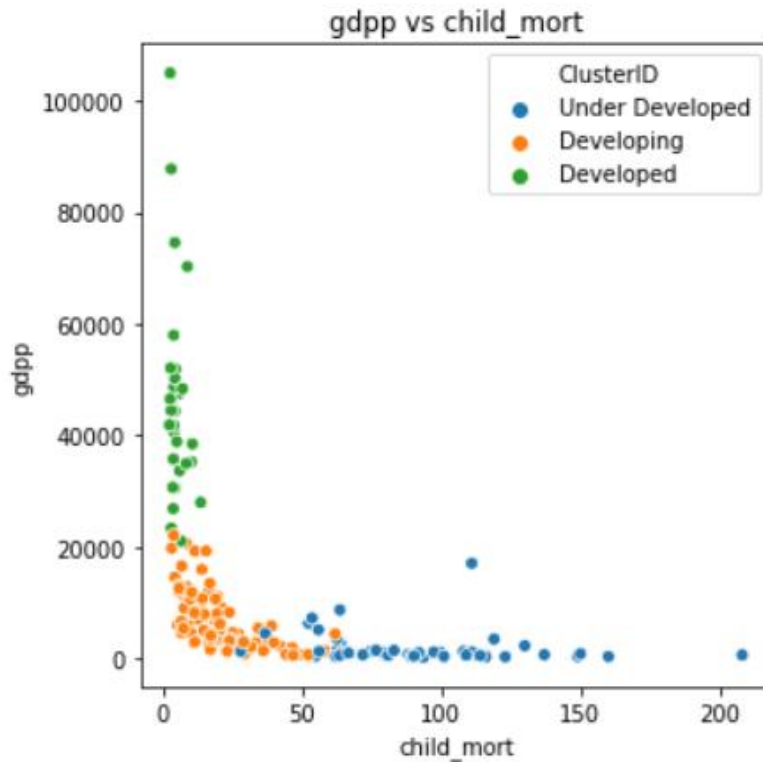
DEVELOPING COUNTRIES

- Mid Level per capita GDP
- Mid Level per capita income
- Mid Level Child Mortality Rate

UNDER DEVELOPED COUNTRIES

- Lowest per capita GDP
- Lowest per capita income
- Highest Child Mortality Rate

CLUSTERING RESULTS – VISUALIZATIONS



Under Developed: countries with extremely low per capita GDP, extremely low per capita income and higher child mortality rate.

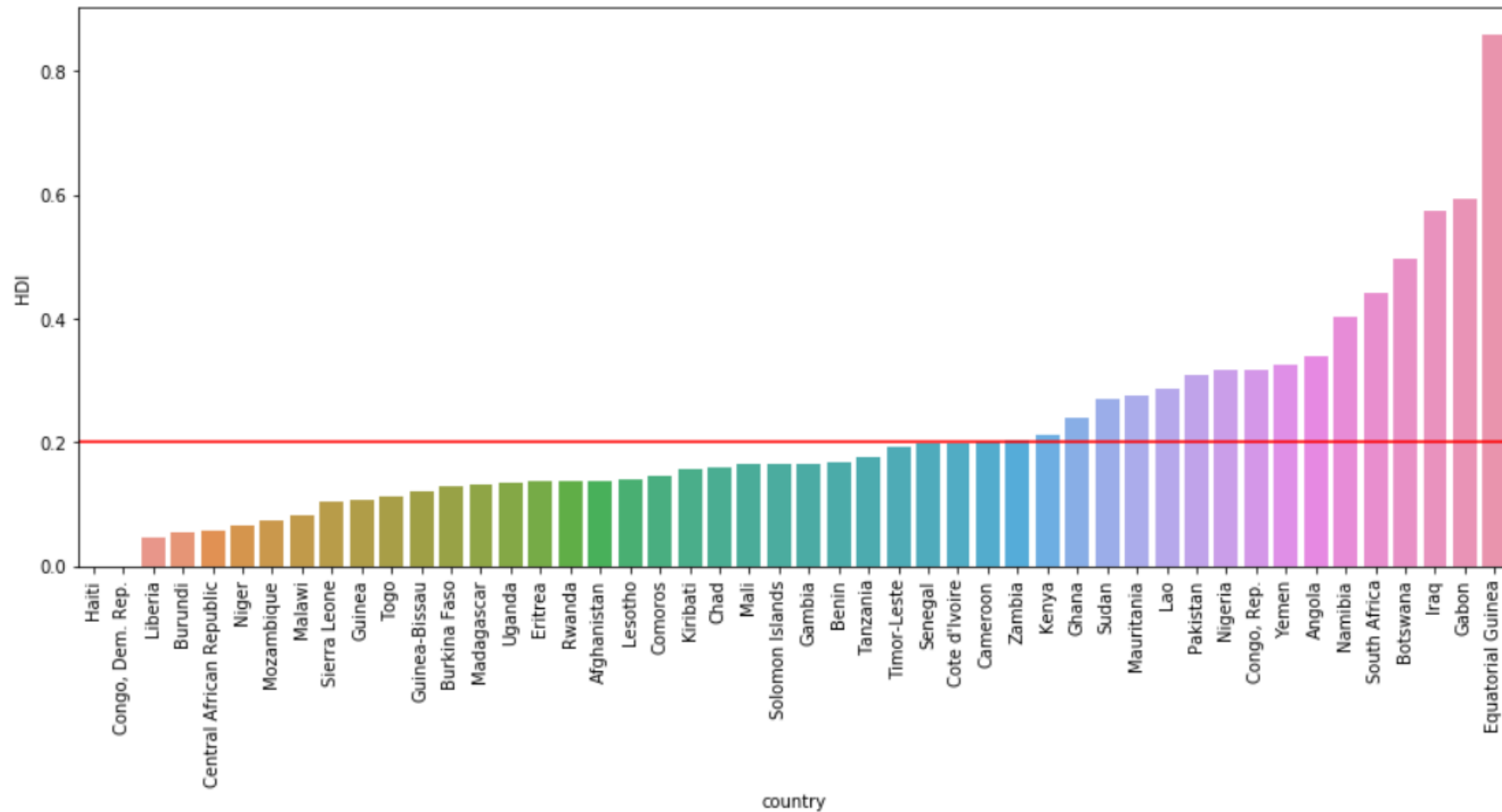
Developing: countries with lower per capita GDP, lower per capita income and lower child mortality rate.

Developed: countries with higher per capita GDP, higher per capita income and extremely low child mortality rate.

HUMAN DEVELOPMENT INDEX (HDI)

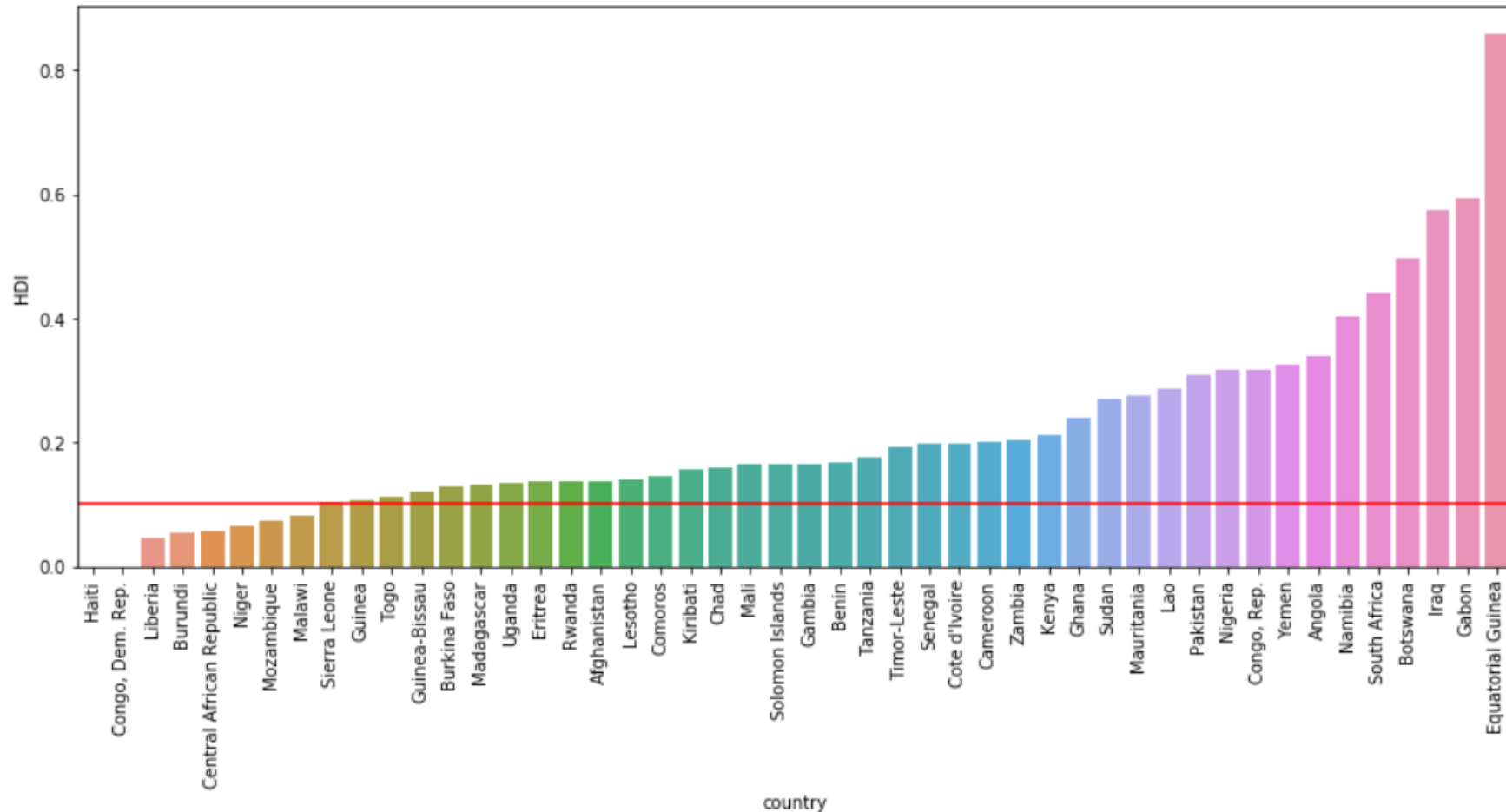
- The **Human Development Index (HDI)** is a statistic composite index of life expectancy, education, and per capita income indicators, which are used to rank countries into four tiers of human development. A country scores a higher HDI when the lifespan is higher, the education level is higher, and the gross national income GNI (PPP) per capita is higher. It was developed by Pakistani economist Mahbub ul Haq and was further used to measure a country's development by the United Nations Development Programme (UNDP)'s Human Development Report Office.
- We obtain 48 countries in the Under Developed Cluster using our clustering algorithm. If we want to reduce the number of countries to focus on, we use the Human Development Index (HDI) to further reduce the number of countries. We have the life expectancy and the per capita income variables in our dataset. We use this data to find an indicator similar to HDI to quantify the countries' development based on these variables.
- Please find more information on HDI using the following link: [HDI](#)

HUMAN DEVELOPMENT INDEX (HDI)



If we choose 0.2 as the threshold value for HDI, we get 30 countries to focus on.

HUMAN DEVELOPMENT INDEX (HDI)



If we choose 0.1 as the threshold value for HDI, we get 8 countries to focus on.

COUNTRIES TO FOCUS ON

	Clustering Algorithm	HDI threshold=0.2	HDI threshold=0.1
Number of countries to focus on	48	30	8
Names of countries to focus on	Haiti, Congo Democratic Republic, Liberia, Burundi, Central African Republic, Niger, Mozambique, Malawi, Sierra Leone, Guinea, Togo, Guinea-Bissau, Burkina Faso, Madagascar, Uganda, Eritrea, Rwanda, Afghanistan, Lesotho, Comoros, Kiribati, Chad, Mali, Solomon Islands, Gambia, Benin, Tanzania, Timor-Leste, Senegal, Cote d'Ivoire, Cameroon, Zambia, Kenya, Ghana, Sudan, Mauritania, Lao, Pakistan, Nigeria, Congo, Rep., Yemen, Angola, Namibia, South Africa, Botswana, Iraq, Gabon, Equatorial Guinea	Haiti, Congo, Dem. Rep., Liberia, Burundi, Central African Republic, Niger, Mozambique, Malawi, Sierra Leone, Guinea, Togo, Guinea-Bissau, Burkina Faso, Madagascar, Uganda, Eritrea, Rwanda, Afghanistan, Lesotho, Comoros, Kiribati, Chad, Mali, Solomon Islands, Gambia, Benin, Tanzania, Timor-Leste, Senegal, Cote d'Ivoire	Haiti, Congo, Dem. Rep., Liberia, Burundi, Central African Republic, Niger, Mozambique, Malawi

Note: We can select the countries belonging to the Under Developed Cluster based on the threshold value of HDI decided by the CEO to find the countries to focus on.