

Vulnerability analysis

Which factors should we consider when examining a country's vulnerability to climate change?

Social / Economic	Environmental
e.g most people rely on farming for their income	e.g current climate

Deep Dive Activity:

There are several tools available to analyse a country’s vulnerabilities to climate change. Each analysis tool uses different methods and considers different factors.

One tool is the Germanwatch Global **Climate Risk Index (CRI)**. It ranks countries in relation to ‘the extent to which they have been affected by the direct impacts of climate related extreme weather events’. Using data on which countries have previously been affected then gives them a basis for understanding which countries *could* be vulnerable in the future and how badly they may be affected. The CRI takes into consideration some social and economic factors but only those that have **directly** affected the country (e.g deaths due to the disaster/costs incurred by the extreme weather) and not **indirect** impacts (drought/food scarcity after a disaster)

CRI has ranked the following countries as most affected by extreme weather in 2019. Mozambique has been ranked the most affected country.

Table 1: The 10 most affected countries in 2019

Ranking 2019 (2018)	Country	CRI score	Fatalities	Fatalities per 100 000 inhabitants	Absolute losses (in million US\$ PPP)	Losses per unit GDP in %	Human Development Index 2020 Ranking ¹⁴
1 (54)	Mozambique	2.67	700	2.25	4 930.08	12.16	181
2 (132)	Zimbabwe	6.17	347	2.33	1 836.82	4.26	150
3 (135)	The Bahamas	6.50	56	14.70	4 758.21	31.59	58
4 (1)	Japan	14.50	290	0.23	28 899.79	0.53	19
5 (93)	Malawi	15.17	95	0.47	452.14	2.22	174
6 (24)	Islamic Republic of Afghanistan	16.00	191	0.51	548.73	0.67	169
7 (5)	India	16.67	2 267	0.17	68 812.35	0.72	131
8 (133)	South Sudan	17.33	185	1.38	85.86	0.74	185
9 (27)	Niger	18.17	117	0.50	219.58	0.74	189
10 (59)	Bolivia	19.67	33	0.29	798.91	0.76	107

PPP = Purchasing Power Parities. GDP = Gross Domestic Product.

Now it's your turn to produce your own climate vulnerability analysis.

We have provided data on 7 of SCIAF's programme countries. It's up to you to decide which factors could show their vulnerability to climate change. You can also use the data from the CRI index above.

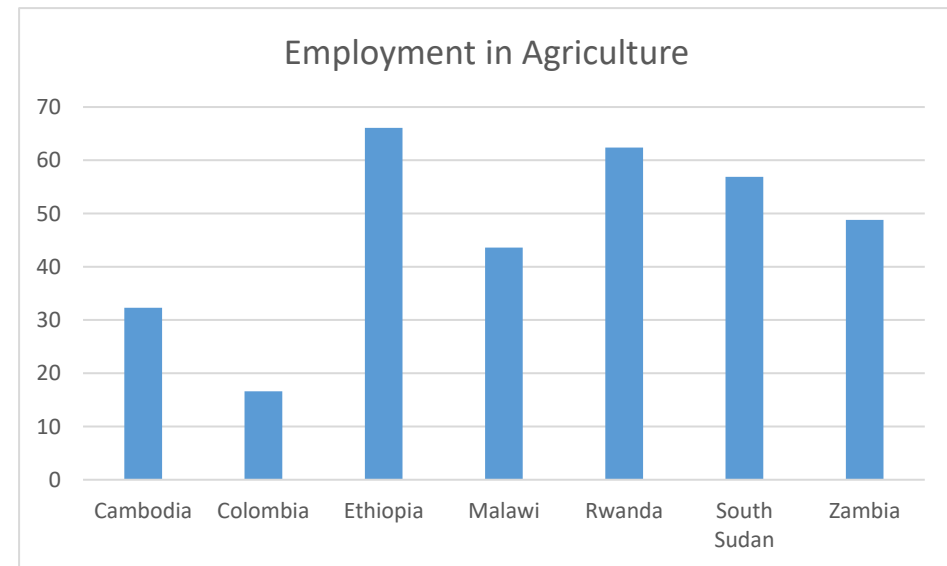
Here is an example.

We have decided to look at the factor 'Employment in Agriculture'.

We chose this factor to illustrate how people in each country would be vulnerable to extreme changes in the climate.

People employed in agriculture would be negatively affected by an environmental disaster like flood or drought because they would lose their source of income.

Using this analysis, we can see that Ethiopia and Rwanda are at a greater risk of the effects of climate change.



		SCIAF Programme Countries						
Definition		Cambodia	Colombia	Ethiopia	Malawi	Rwanda	South Sudan	Zambia
From the UN Human Development Report 2020								
UN Human Development Index Rank (of 189 countries)	<p><i>UN ranks the world's countries by their human development: by whether people in each country have the freedom and opportunity to live the lives they value.</i></p> <p>Countries are ranked in order from 1-189 - 1 being the country where people have the <u>most</u> opportunity for development and 189 being the <u>least</u>. Economically developing countries are usually at the lower end of the Index (189) and wealthier nations at the upper end (1).</p>	144	83	173	174	160	185	146
Employment in agriculture (% of total employment)	<p><i>Definition: Share of total employment that is employed in agriculture. Source: ILO (2020). ILOSTAT database. https://ilostat ilo.org/data/</i></p> <p><i>People who rely on growing food for their income to sustain their families are vulnerable to any changes in the environment.</i></p>	32.3	16.6	66.1	43.6	62.4	56.9	48.8
Total population (millions)	<p><i>Definition: population in a country, area or region. Source: UNDESA (2019a). World Population Prospects: The 2019 Revision. Rev 1. New York. https://population.un.org/wpp/</i></p>	18.8	53.4	144.9	24.8	16.2	13.8	24.3
Internet users (total % of population)	<p><i>Definition: People with access to the worldwide network. Source: ITU (International Telecommunication Union) (2020). ICT Facts and Figures 2020. www.itu.int/en/ITU-D/Statistics/Pages/stat/.</i></p> <p>Access to information can be an important factor in disaster risk reduction. If communities have access to information they can plan and prepare for potential disasters, they can find out where they can get help and support after a disaster.</p>	40	62.3	18.6	13.8	21.8	8	14.3

		SCIAF Programme Countries						
Definition		Cambodia	Colombia	Ethiopia	Malawi	Rwanda	South Sudan	Zambia
Forest area (% of total land area)	<p><i>Definition: Land spanning more than 0.5 hectare with trees taller than 5 metres and a canopy cover of more than 10%</i> <i>Source: World Bank (2020a). World Development Indicators database. Washington, DC. http://data.worldbank.org.</i></p> <p>This relates to naturally growing forest, not manmade (in parks, plantations etc). A large forest area can mean a wealth of biodiversity. Forests can also help mitigate climate change and its effects as they soak up carbon dioxide and can be a natural barrier to floods.</p>	52.9	52.7	12.5	33.2	19.7	n.a	65.2
Mortality rate attributed to household and ambient air pollution (per 100,000 population, age-standardized)	<p><i>Definition: Number of deaths attributable to air pollution, per 100,000 population. The rates are age-standardized. The diseases taken into account include respiratory infections and lung cancers</i> <i>Source: WHO (World Health Organization) (2020). Global Health Observatory. www.who.int/gho/</i></p> <p>Too often we are polluting the earth and making people sick. For communities already struggling with air pollution from factories, cars and mining developments, climate related events often make their situation worse and can make them more vulnerable.</p>	150	37	144	115	121	165	127
Mortality rate attributed to unsafe water, sanitation and hygiene services (per 100,000 population)	<p><i>Definition: Number of deaths due to diarrhoea, intestinal infections and malnutrition that are attributable to inadequate water, sanitation and hygiene services, expressed per 100,000 population.</i> <i>Source: WHO (World Health Organization) (2020). Global Health Observatory. www.who.int/gho/.</i></p> <p>Communities that don't have access to safe drinking water are vulnerable to disease. Extreme weather events like a flood or cyclone can contaminate what relatively safe water you have.</p>	6.5	0.8	43.7	28.3	19.3	63.3	34.9

		SCIAF Programme Countries						
Definition		Cambodia	Colombia	Ethiopia	Malawi	Rwanda	South Sudan	Zambia
Number of deaths and missing persons attributed to natural disasters (per 100,000 population)	<i>Definition: Number of people who died during or directly after a natural disaster as a direct result of the event, per 100,000 of the population. Source: United Nations Statistics Division (2020a). Global SDG Indicators Database. https://unstats.un.org/sdgs/indicators/database/.</i>	0.3	0.8	0	7.1	0.3	2.7	0.1
Urban population (%)	<i>Definition: population living in areas classified as urban according to the criteria used by each country or area as of 1 July. Source: UNDESA (2018). World Urbanization Prospects: The 2018 Revision. New York. https://esa.un.org/unpd/wup/.</i> This definition also gives you an idea of the rural population numbers. In general, rural populations (farming/fishing communities) are more vulnerable to the effects of climate change.	23.8	81.1	21.2	17.2	17.3	19.9	44.1
Rural population with access to electricity (%)	<i>Definition: People living in rural areas with access to electricity, expressed as a percentage of the total rural population. Source: World Bank (2020a). World Development Indicators database. Washington, DC. http://data.worldbank.org. Accessed 22 July 2020.</i>	89	99.7	32.7	10.4	23.4	23.7	11
From the Climate Risk Index (CRI) 2021								
Climate Risk Index Rank	Germanwatch have analysed data and given each country a ranking on the index in terms of how they've been affected by extreme weather events. (1 being most affected and 130 least affected)	84	28	72	5	42	8	59

From CIA World Factbook 2021								
Average yearly temperature (degrees Celsius)	<i>Definition: An average taken of minimum and maximum daily temperatures</i>	26.8	24.5	22.2	21.9	17.85	26.9	21.4
Average rainfall ranking	<i>Definition: A ranking for 182 countries in the world based on their annual rainfall in mm depth per year – 1 being highest rainfall, 182 being lowest.</i>	38	1	102	77	75	99	95
Percentage % of the population living in extreme poverty	<i>Definition: People surviving on less than \$1.90 a day are living below the international poverty line and are living in extreme poverty.</i> \$1.90 is around £1.38. If countries are already unstable due to extreme poverty, it makes their communities more vulnerable to climate change.	16.5	35.7	23.5	51.5	38.2	76.4	54.4

Scottish Catholic International Aid Fund

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