

Hunger Strike: The climate and food vulnerability index

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Christian Aid is a Christian organisation that insists the world can and must be swiftly changed to one where everyone can live a full life, free from poverty.

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Cover: A woman in Burkina Faso waters a market garden. Photo: Mike Goldwater/Christian Aid

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Introduction

In 2018 the Intergovernmental Panel on Climate Change published its Special Report on Global Warming of 1.5C which laid out in stark terms the damage that 1.5C of warming would bring and outlining how urgent changes would need to be enacted if this target is to be avoided.

On 8th August 2019 the IPCC is following this up with a report which will examine the relationship between the global climate emergency and our use of land and how it will affect food and water systems in the coming years.

Food insecurity

One of the primary threats to human life caused by climate change is food insecurity, particularly in the global south, where people are more reliant on small-scale agriculture and pastoralism and are vulnerable to droughts, floods and extreme weather. Richer countries are often more food secure because they can invest in the best infrastructure and equipment to maximise their own domestic food systems and have food safety-net programmes. They are also less reliant on domestic agriculture in general, as they can afford to switch international supply chains to take advantage of the lowest prices. Often this can result in them abandoning fragile economies when extreme weather ruins their crops.

In July 2019 a study in Lancet Planetary Health showed that over the next 30 years, climate change combined with increasing carbon dioxide (CO₂) could significantly reduce the availability of critical nutrients like protein, iron, and zinc.¹

What makes this particularly unjust is that the people who are suffering from these impacts are the least responsible for their plight. That responsibility is with countries who have become rich from a carbon intensive development path. It is their responsibility to make major emissions cuts in their own countries to reverse climate change and to invest in the global efforts to move to a net zero carbon pathway. It is also their responsibility to fund vulnerable countries to adapt to the devastating impacts of climate change as outlined by the IPCC.

Denying IPCC climate science – a double injustice

The IPCC process is the most far-reaching, rigorously reviewed and comprehensive scientific research project ever undertaken. Despite this, at recent meetings of the UNFCCC, both in Katowice, Poland in December 2018 and in Bonn in June 2019, high emitting countries such as Russia, the USA and Saudi Arabia not only failed to commit to slashing their emissions in support of those low emitting climate vulnerable countries, but they also blocked the adoption of the IPCC's 1.5C report by the other countries in attendance.

If the world is going to mitigate climate change and address the suffering it has and will continue to cause many parts of the world, it is vital that countries recognise, and act on the scientific evidence that now demonstrates an ongoing and intensifying climate and environment emergency.

The Climate and Food Vulnerability Index

Climate and Food Vulnerability Index rank	Country	Food Insecurity score	CO2 emissions per capita (tonnes)	CO2 emissions per capita rank (out of 113)
1	Burundi	23.9	0.027	113
2	Congo (Dem. Rep.)	26.1	0.043	112
3	Madagascar	27	0.163	104
4	Yemen	28.5	0.443	90
5	Sierra Leone	29.2	0.173	103
6	Chad	31.5	0.062	110
7	Malawi	32.4	0.084	109
8	Haiti	33	0.321	96
9	Niger	33.7	0.116	107
9	Zambia	33.7	0.29	97

The injustice of this and the impact of the climate emergency on our food system is laid bare in the Climate and Food Vulnerability Index which combines a ranking of countries based on their vulnerability to food insecurity along with their carbon emissions as a proportion of population.

For the countries topping the list, some degree of political instability, conflict, land degradation, loss of agrobiodiversity, gender inequality that does not recognise the major role of women farmers and a failure to invest in sustainable, resilient agriculture has contributed to their plight. Climate change has exposed these failures and accelerated increasing food insecurity – according to the UN's Food and Agriculture Organisation (FAO), the number of malnourished has increased globally for the past 4 years to 821 million after decades of decline ²- and shown the need for a transformative solution to food production and the support that small-scale farmers and herders receive.

Food insecurity scores are calculated using data from the Economist Intelligence Unit's food security rankings which are assessed across three categories; food affordability, availability and quality.³ The CO2 emission data is from the 2018 report by the Emission Database for Global Atmospheric Research (EDGAR) which assesses emissions for 2017, the most recent international audit.⁴

Perversely, the country topping the Index – the country which is most food insecure – is Burundi, which also happens to be the lowest contributor of carbon emissions in the world. Burundi's 0.027 tonnes per capita of CO2 is so low it's often rounded to zero. The second most food insecure country is the Democratic Republic of the Congo, and it also has the second smallest carbon footprint in the Index, 0.043. All the top ten most at risk countries emit less than half a tonne of CO2 per capita. In percentage terms the top 10 generate a combined 0.08% of total global CO2.

In comparison, the countries that have blocked the adoption of the IPCC's findings carry some of the biggest responsibility for climate change. Russia contributes 12.3 tonnes of CO2 per person, the United States 15.7 tonnes and Saudi Arabia 19.4 tonnes. The data also reveals the current responsibility of other more developed countries such as the UK at 5.7 tonnes, China at 7.7, South Africa at 8.2, Poland at 8.4, Germany at 9.7, Japan at 10.4, South Korea at 13.2, Australia at 16.5 and Canada at 16.9 tonnes.

That means that the average person in the UK generates as much CO2 as 212 Burundians. A Russian generates as much CO2 as 454 Burundians, an American 581 and a Saudi 719.

Other selected countries

Climate and Food Vulnerability Index rank	Country	Food Insecurity score	CO2 emissions per capita (tonnes)	CO2 emissions per capita rank (out of 113)	Equivalent number of Burundians emissions per person
68	China	65.1	7.717	28	285
69	South Africa	65.5	8.245	23	305
72	Russia	67	12.257	12	454
82	Saudi Arabia	72.4	19.393	5	719
88	Poland	75.4	8.358	21	310
89	South Korea	75.6	13.207	11	489
96	Japan	79.9	10.360	13	384
103	Germany	82.7	9.700	16	359
105	Canada	83.2	16.855	7	624
108	Australia	83.7	16.452	8	609
110	United Kingdom	85	5.729	37	212
110	United States	85	15.741	9	581

Country profiles

Burundi

Nowhere better demonstrates the injustice of climate change than Burundi. The country with the smallest carbon footprint, a tiny 0.027 tonne per person, suffers more from food insecurity than any other country. The prevalence of chronic malnutrition in Burundi is already the highest in the world, with an estimated economic impact of \$102 million a year. 56% of children are stunted⁵. Only urgent global action to halt the climate emergency can save Burundi from future climate shocks.

With 90% of the population employed in agriculture, landlocked Burundi is highly vulnerable to climatic changes.

The changing climate acts as a threat multiplier, further threatening food security already made precarious through conflict and political unrest. The risks are highest in the north of the country which is already vulnerable to rainfall shortages and in some zones soil erosion, and in the western Imbo plains which experience both rainfall shortages and floods.⁶

In the region of Kirundo, in the north of Burundi, the sandy and dry land rises at the slightest breath of wind. Previously, this province was among the most productive in the country. But for a decade, the rains have become inadequate and irregular. Over the past three years, it has only rained four months instead of nine in the communes of Busoni and Bugabira, traditional grain producing centres of this region of more than 500,000 inhabitants.

Food security risks are highest during the long dry season (May-September), which has increased in duration in recent decades and will be getting drier and hotter due to climate change. Extreme floods and droughts are estimated to result in a yield decline of 5-25% in coming decades and reduce long-term GDP growth by 2.4% per year⁷.

Despite facing many challenges, the country has abundant natural resources, particularly minerals and solar and hydropower potential, which it could harness with the right investment support to develop cleanly and continue to be a minimal contributor of global emissions.

Democratic Republic of the Congo

The DRC is the second lowest contributor of carbon emissions in the world, producing less than 0.04 tonnes of CO₂ per capita, which like Burundi's is so small it's rounded down to zero in many reports. It also comes second in the Index with climate change acting as a threat multiplier to the country's other problems of internal displacement, conflict and Ebola.

The climate crisis is predicted to have its biggest impact in the northeast, with increasing temperatures and changing rainfall patterns. Temperature change estimates see an average increase of 1-3C between 2010 and 2050.⁸

These changes are likely to result in an increased frequency of extreme events, primarily floods (resulting in erosion, landslides, and crop failure) but in some cases also droughts. Whereas problems due to excess of rainfall are mainly expected in central DRC, droughts are forecasted primarily for the south.

Food security will be particularly affected by the changing climate through land and infrastructure degradation due to erosion and landslides, an increase in livestock and crop diseases due to temperature rises, direct crop failure due to floods and heavy rains, increased soil nutrient leaching and growth of fungal diseases due to higher humidity.

Food security may also be affected through the effects of climate change on fisheries. Increasing water temperatures are reported for various lakes in the Great Lakes region, including Kivu and Tanganyika at DRC's eastern borders.

Madagascar

Within the top ten smallest carbon emitters per capita, the world's fourth largest island is one of the most vulnerable nations to natural disasters and is Africa's most cyclone-exposed country.

A quarter of the population lives in areas highly prone to cyclones, floods or drought. Climate change and environmental degradation exacerbate these risks while the increasing fragility of the ecosystem intensifies vulnerability to shocks and food insecurity.

92% of Madagascar's population lives below the absolute poverty line of less than \$1.90 per day and it has the fourth highest rate of chronic malnutrition for under 5s. Seven out of ten small-scale farmers own less than 1.2 hectares of land.⁹

In recent decades, Madagascar has already seen rainfall intensity increase during cyclones with this trend expected to continue as climate change worsens. It is predicted that average temperatures will increase 2.5C to 3C by 2100. Extremes are expected to grow with rainfall reducing during the dry season while rainfall will increase during the rainy season by 2065. By 2100 cyclone intensity is projected to increase by almost 50%.¹⁰

Madagascar's unique and varied biodiversity is also at risk from climate change including coral reefs, forests and wetlands, the latter two of which are valuable carbon sinks. The country's 300,000 hectares of mangroves provide resilience to storm surges and waves but are under threat from sea level rise.

Yemen

Yemen has been in the news this year due to the dire humanitarian situation caused by bombing from Saudi Arabia that has pushed many people towards famine and reliant on aid organisations to survive. However its vulnerability to climate change is less well known.

Abdulhakim Aulaiah - a former official in the Environmental Protection Authority, a government agency within the Yemeni Water and Environment Ministry, said:

"Climate change has affected most aspects of life in Yemen.

"Sea level rise is causing environmental issues in ports such as Aden and al-Hodeidah. As a result of unusually high temperatures, malaria is spreading. Fluctuations in rainfall have affected crop yield across Yemen. The supply of fish in the seas around Yemen is decreasing, and several species have vanished. Climate change is one of the biggest threats to biodiversity."¹¹

Yemen is an arid country in the Arabian Peninsula with average temperatures of 21C. It experiences extreme water scarcity as well as salt water intrusion in coastal areas which will only increase with sea level rise. Climate change is expected to increase temperatures, variability of rainfall and heavy precipitation events. The increase in heavy rains in combination with rising temperatures, especially in the north, will probably lead to shortened growing seasons. Shorter growing seasons threaten food security, and competition for dwindling natural resources could further fuel conflict.

Over the last 30 years, temperatures have significantly increased, at a rate of 0.19C per decade. The mean annual temperature is expected to increase by 1.2-3.3C by 2060 and by 1.6-5.1C for the end of this century. Scientists predict a strong increase in the duration of heat waves, as well as a strong reduction in duration of cold spells. The rate of warming is more rapid in the interior regions.¹²

The port-city of Aden is one of the top 20 cities in the world with the most people at risk from sea level rise and storm surges in the developing world.¹³

Sierra Leone

One of the most vulnerable countries to the impacts of the climate emergency, with agriculture providing livelihoods for 75% of the population and contributing more than 50% of the country's GDP.¹⁴

Sierra Leone suffered devastating floods in 2015 and a major landslide in 2017 that killed over 1000 people when heavy rains compounded deforestation and unplanned settlement expansion. Being on the coast, Sierra Leone is also vulnerable to sea level rise

Since 1960 already high average temperatures have increased nearly by 0.8C. Temperatures are forecast to rise a further 1-2.5C by 2060.¹⁵

Food insecurity is already pervasive, with 50% of the population lacking access to sufficient nutritious food to live a healthy life. Chronic malnutrition is widespread, with the prevalence of stunting at 31.3%, above the World Health Organisation's 'high' threshold of 30%.¹⁶

Rice, accounting for the largest share of agricultural GDP and 42% of the average person's caloric intake, is highly sensitive to increased humidity and rainfall intensity and is vulnerable to pests that thrive in the higher temperatures expected from the changing climate.

Chad

With the fourth lowest carbon footprint, just 0.06 tonnes per person, Chad contributes almost nothing to global warming and yet in 2016 it was listed as the most vulnerable country to climate change.¹⁷

Bigger than Nigeria and twice the size of Texas, most of Chad's 11m people live in the south of the country as much of the northern part is Sahara Desert. High temperatures and arid conditions are a major threat with temperature increases in the region are projected to be 1.5 times higher than in the rest of the world. Scientists estimate Chad could see an average temperature increase of 4C by 2100.¹⁸

These hot temperatures have a considerable impact on surface water availability in a region that is already experiencing shortages and suffered four severe droughts between 2005 and 2012. 90% of the country's largest lake, Lake Chad, has disappeared over the past 50 years due to a combination of droughts and increasing withdrawals for irrigation. Although there are signs it's starting to recover, it demonstrates the urgent need for cross-border cooperation in the management of the Lake Chad Basin as a whole so as to avoid the kind of problems that have destroyed the Aral Sea in Central Asia.¹⁹

These challenging conditions, along with political unrest, have led to Chad already having some of the highest hunger levels in the world with 87% of the population living below the poverty line. Around 40% of children under 5 are stunted through malnutrition, according to the World Bank.²⁰

Malawi

Another country in the top five of the smallest carbon footprints, Malawians generate less than 0.1 tonnes of CO2 per person. Despite this, Malawi has seen its average temperatures rise 0.9C since 1960, with less predictable rains, more hot days and increased intensity, frequency and magnitude of floods and droughts. The 2018/19 season exemplified this, with southern districts affected by erratic rains and dry spells delivering drought-stressed crops, ending with extreme, cyclone-related flooding sweeping away what little yield farmers were expecting to harvest.

This is set to worsen over the coming years with average temperatures to increase between 1-3C by 2050 and a 20% increase in rainfall during extreme events by 2090.

Agriculture plays a vital role in the economy, accounting for 90% of the country's export earnings. In 2015 maize production fell by 30% due to floods in the south, followed by a countrywide drought that put 17% of the population at risk of food insecurity. The increased frequency of droughts and floods, along with higher temperatures, also negatively impact fisheries, wildlife and forests, which provide food, income, fuel and other environmental services to vulnerable populations.

The country's growing drought conditions are expected to continue to lower water levels in Lake Malawi and the Shire River, further reducing hydropower production, which supplies around 95% of Malawi's electricity.²¹

Haiti

The poorest country in the Western hemisphere and the only country in this top ten from the Americas, Haiti is known as being a victim of natural disasters. The Category 4 Hurricane Matthew that left 1.5 million in need of humanitarian relief in 2016 was the sixth major storm to hit Haiti in the past 30 years.

The intensity of strong Atlantic hurricanes has substantially increased since 1980 and this trend will continue by up to 10% by 2050. This combined with deforestation and sea level rise of up to 0.4m by 2030, will leave Haiti more vulnerable to storm surges and flooding.

Temperatures are also set to continue to rise. Already the average temperature has increased 0.45C since 1960 which has led to the number of hot days per year growing by 63. Scientists predict temperature increases of up to 2.16C by 2050.²²

Haiti already does not grow enough food to feed itself, with 50% of the country's needs, and 80% of its main staple, rice, imported. This makes the country vulnerable to inflation and price volatility in international markets, in addition to its vulnerability to climate impacts.²³

However, NGOs like Christian Aid's local partner organisations, as well as the Haitian Government, have been working to help strengthen community resilience and move beyond humanitarian relief. After Hurricane Matthew Christian Aid's partners trained young people in building methods that would withstand future hurricanes, planting 100,000 trees a year to act as a natural storm defence and providing alternative livelihoods to forestry.

Earlier this year Prime Minister Jean Henri Céant launched the Food Security and Nutrition Programme. He said: *"Indicators of food insecurity and malnutrition highlight a worrying situation. The successive shocks we have suffered make the task all the more complex. The government is aware of the enormous challenge it is facing to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture."*²⁴

Niger

Niger has the 7th smallest carbon footprint in the Index but is at the forefront of climate breakdown in the arid Sahel region of West Africa. Average temperatures increased by 0.6-0.8C between 1970 and 2010. By 2100 Niger is expected to see a 4C average temperature rise and in much of the region 'cold' nights will not occur at all by the 2090s.²⁵

Agriculture contributes 40% of the combined regional GDP and employs more than 70% of the labour force in Niger.

Staple crops include sorghum, millet and cowpea, while cotton and groundnut constitute major cash crops. Temperature increases higher than 2C are projected to decrease millet and sorghum yields by 15–25% by 2080.²⁶

More than 1.5 million people in Niger were affected by food insecurity in 2017 with another 1.5 million estimated to be chronically

food insecure. Millions more experience transitory shortages during the lean season. Already, nearly 20% of the population cannot meet their food needs.²⁷

Zambia

Although Zambia was reclassified as a lower middle-income country by the World Bank in 2011, 63% of the population live in poverty and 40% of children are stunted through malnutrition.²⁸

Droughts and floods have increased in frequency and intensity over the last two decades and adversely impacted food and water security, energy generation and livelihoods. Since 1960 average temperature has increased by 1.3C. This trend is projected to continue, with mean annual temperatures set to increase between 1.2C and 3.4C by 2060.²⁹

These hotter temperatures are likely to spell danger for the country's food security. Projections indicate reductions in maize yields in the 2020's, 2050's, and 2080's. Many communities, especially those in the Southern Province, depend on cattle as a source of livelihood and nutrition. With the recent increases in droughts, these communities could also be further affected due to decreases in cattle populations.³⁰

Solutions and recommendations

There are three urgent responses needed to help tackle climate change and address food insecurity.

1. First the rapid response to climate change – emissions reductions are needed in all countries but with responsibility placed firmly with the wealthy. The recent IPCC 1.5C report³¹ found that to avert the worst impacts of climate change, we need to roughly halve emissions globally by 2030.

And given the need for global net zero by 2050 or earlier, there must be greater support to spread renewable energy in developing countries to ensure that they can leapfrog dirty fossil fuels and address energy poverty. Energy poverty reduces farmer capacity to add value to their produce through local processing and storage. Through the new generation of small-scale renewables, there is a huge opportunity to transform energy generation and use that puts agency back into the hands of the energy user rather than anonymous corporates that generate monopoly profits off the backs of their customers.

2. Vulnerable countries need to be supported towards being more food secure. The first step may be humanitarian relief but to really tackle food security it's vital that richer countries provide financial support and technology, as well as expertise from agroecological experts, to enhance the resilience and productivity of small scale producers.

With over 40% of greenhouse gas emissions generated by food production and use, strengthening food security in the face of climate change will be a challenge that all countries, rich and poor, must face. This requires a transformation away from the failing approaches of the past – the overuse of toxic chemical pesticides and fertilisers degrading land, soils and water, the overreliance on a shrinking number of crops and crop varieties that has stripped essential vitamins and minerals from food and reduced food quality; and the expansion of intensive commercial agriculture that drives deforestation and catchment degradation, increasing flood risks and weather extremes while destroying valuable biodiversity.

Reforestation programmes, such as the now 15% completed Great Green Wall across the Sahel, need support to accelerate their restorative and resilience-building benefits.

3. Early warning systems and weather information. Anticipation of both changing climate and extreme weather events needs a step change. The current approach is largely based on emergency declaration after a climate shock arrives. This means that the potential early warning from continually improving weather forecasts is missed and the benefits of anticipation – crop damage mitigated, livestock moved, farm equipment and food stores protected – are lost. Although progress has been made for fast-onset shocks such as cyclones, the longer window of opportunity before a drought-

related food emergency occurs, remains mostly unused. Ensuring access to impact forecasts that can support farmer decision-making for short-term weather extremes as well as longer-term climate change is essential to ensure that they can build their resilience to future conditions.

Case Study: Burundi



In Burundi Christian Aid has helped train small scale farmers to diversify their crops including to grow sunflowers. Photo Sarah Rowe/Christian Aid.

In 2018, nearly 100,000 people were affected by climate hazards in Burundi. Between January and October, 4,600 homes were damaged or destroyed, hundreds of hectares of cultivation were flooded and 216 classrooms were damaged, affecting more than 5,000 students.

Christian Aid is helping farmers to be more resilient through the promotion of new early harvest vegetable crops that are adaptable to climate change as well as composting techniques and better land management to boost maize, soya and wheat crops.

It also promotes livelihood diversification through youth entrepreneurship, sunflower growing and adding value for honey producers. And despite their already tiny carbon footprint communities are being helped to access solar energy to power their agricultural practices.

Philip Galgallo, Christian Aid's Country Director for Burundi, said: *"Burundi is a living testament to the injustice of the climate crisis. Despite producing almost no carbon emissions, we find*

ourselves on the front line of climate change, suffering from higher temperatures, lower crop yields and increasingly unreliable rains.

“In a just world our problems would be something we could address ourselves. But because we haven’t caused this climate breakdown, we alone cannot solve it. We need richer, more polluting, countries to cut their emissions rapidly if we’re going to hold back the ravages of climate change and reverse their affects. Because of the global nature of climate change this is an opportunity for the world to act together in solidarity and fairness.

“We have great potential for clean energy, but we need funding and support to unlock it. We have renewable resources of wind and solar with which we can power our development, but we don’t have the finances or technology to harness them.

“It is vital that developed country Governments heed the warnings of the UN scientists and cut their emissions urgently. The lives of millions of the poorest people demand that they do.”

Case study - Malawi



Women working in a rice paddy in Malawi, a crop that has been introduced to help improve the country’s food security. Photo Hannah Richards/Christian Aid

In Malawi, Christian Aid has worked with communities to build resilience through a coalition of NGOs as part of the Enhancing Community Resilience Program. These include:

- Energy efficient stoves to reduce fuel waste
- Solar powered irrigation systems to improve crop watering
- Providing seeds and helping to cultivate drought resistant crops

- Livestock management techniques
- Early warning systems and weather information

This work resulted in food security more than doubling. The percentage of families that could go for nine months on their own food supplies went from 15% to 35%. The food insecure population in the area dropped by more than 23%. Families' income also went up by 125%, and the value of their assets by 151%

The Climate and Food Vulnerability Index – Full table

Climate & Food Vulnerability Index rank	Country	Food Insecurity score	CO2 emissions per capita (tonnes)	CO2 emissions per capita rank (out of 113)
1	Burundi	23.9	0.027	113
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7	Malawi	32.4	0.084	109
8	Haiti	33	0.321	96
9	Niger	33.7	0.116	107
9	Zambia	33.7	0.29	97
11	Syria	34.1	1.553	70
12	Guinea	34.9	0.215	101
13	Mozambique	35	0.261	99
14	Ethiopia	36	0.142	105
15	Sudan	36.4	0.396	93
16	Tanzania	37.1	0.256	100
17	Burkina Faso	37.9	0.177	102
18	Nigeria	38	0.497	89
19	Laos	38.3	0.411	91
20	Rwanda	38.4	0.091	108
20	Togo	38.4	0.365	95

22	Angola	38.6	1.037	77
23	Tajikistan	40.7	0.639	83
24	Benin	41	0.635	84
25	Uganda	41.4	0.118	106
26	Kenya	41.9	0.374	94
26	Senegal	41.9	0.611	85
28	Mali	42	0.051	111
29	Cambodia	42.3	0.66	81
30	Cameroon	42.4	0.406	92
31	Bangladesh	43.3	0.513	88
32	Myanmar	45.7	0.533	86
33	Cote d'Ivoire	45.8	0.515	87
34	Uzbekistan	45.9	2.988	55
35	Nepal	46	0.28	98
36	Venezuela	47.4	4.562	47
37	Pakistan	49.1	1.001	78
38	India	50.1	1.833	66
39	Honduras	50.7	1.14	75
39	Bolivia	50.7	1.851	65
41	Ghana	50.9	0.646	82
42	Nicaragua	51.1	0.952	80
43	Guatemala	51.4	1.05	76
44	Philippines	51.5	1.307	72
45	Algeria	52.1	3.871	51
46	El Salvador	53.7	1.232	73
47	Sri Lanka	54.3	1.149	74
48	Indonesia	54.8	1.937	64
48	Ecuador	54.8	2.376	59

50	Morocco	55	1.723	68
51	Ukraine	55.7	4.652	46
52	Vietnam	56	2.289	61
53	Egypt	56.3	2.652	57
54	Jordan	57	2.532	58
55	Paraguay	57.2	0.959	79
55	Dominican Republic	57.2	2.146	62
57	Kazakhstan	57.7	14.623	10
58	Azerbaijan	58.2	3.312	53
59	Peru	58.7	1.739	67
60	Thailand	58.9	4.046	49
61	Serbia	59.8	6.634	31
62	Botswana	60.8	3.453	52
63	Tunisia	60.9	2.743	56
64	Panama	61.9	2.99	54
65	Colombia	63.7	1.528	71
66	Turkey	64.1	5.32	39
67	Bulgaria	64.5	6.997	29
68	China	65.1	7.717	28
69	South Africa	65.5	8.245	23
70	Belarus	65.7	6.584	32
71	Mexico	66.4	3.927	50
72	Russia	67	12.257	12
73	Bahrain	67.8	23.968	2
74	Malaysia	68.1	8.183	24
75	Brazil	68.4	2.355	60
76	Romania	68.9	4.123	48
77	Argentina	69.2	4.743	44

78	Costa Rica	69.3	1.659	69
79	Slovakia	70.3	6.949	30
80	Uruguay	71.3	2.005	63
81	Greece	71.6	6.465	33
82	Saudi Arabia	72.4	19.393	5
83	United Arab Emirates	72.5	21.574	4
84	Hungary	72.8	5.231	40
85	Oman	74.4	16.915	6
86	Kuwait	74.8	23.486	3
87	Chile	75.1	5.003	43
88	Poland	75.4	8.358	21
89	South Korea	75.6	13.207	11
90	Czech Republic	76.1	10.336	14
91	Italy	76.3	6.085	35
92	Qatar	76.5	37.052	1
93	Spain	78	6.091	34
94	Israel	78.6	8.041	26
95	Portugal	79.3	5.496	38
96	Japan	79.9	10.36	13
97	Belgium	80.2	9.119	18
98	Denmark	80.9	5.855	36
99	New Zealand	81.3	7.819	27
100	Austria	82.1	8.271	22
101	Sweden	82.2	5.133	42
101	Norway	82.2	8.848	19
103	Germany	82.7	9.7	16
104	France	82.9	5.205	41
105	Canada	83.2	16.855	7

106	Finland	83.3	8.482	20
107	Switzerland	83.5	4.688	45
108	Australia	83.7	16.452	8
109	Netherlands	84.7	10.259	15
110	United Kingdom	85	5.729	37
110	United States	85	15.741	9
112	Ireland	85.5	8.172	25
113	Singapore	85.9	9.637	17

End notes

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