



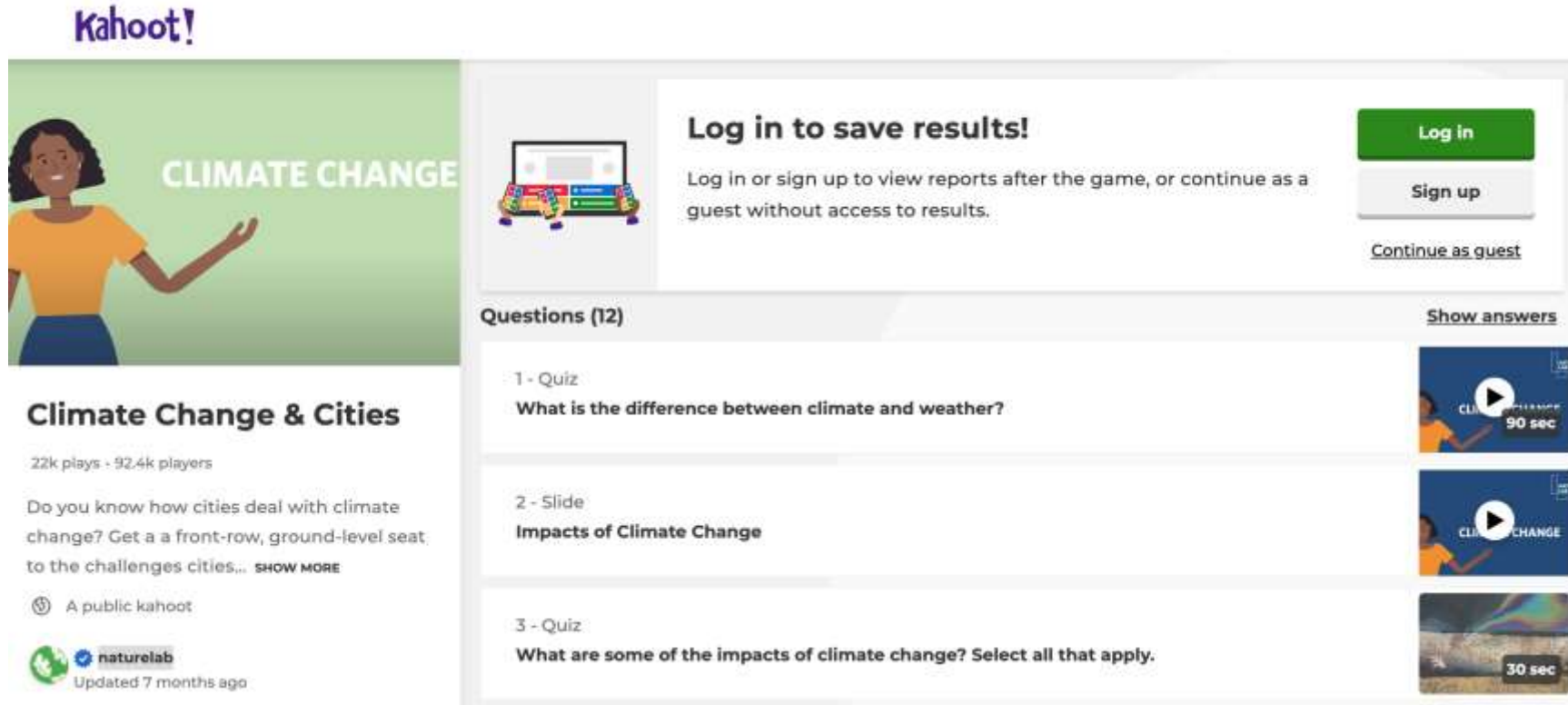
Climate Justice

Developing the Next Generation of Female Environmentalists

Farrah Grant, Geography/Geology

May 3, 2023

Kahoot! Climate Change Review



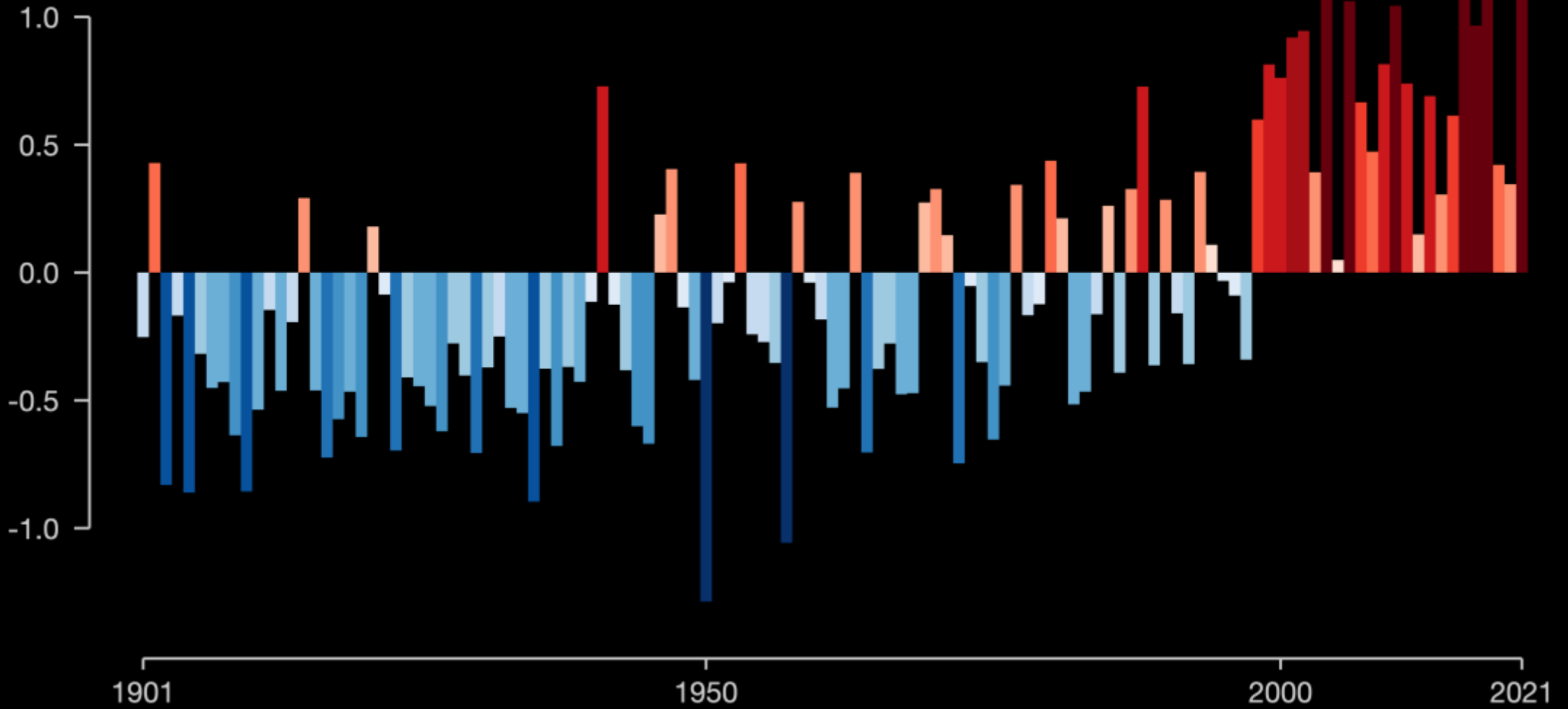
The image shows the Kahoot! interface for a quiz titled "Climate Change & Cities". On the left, there is a green banner with the Kahoot! logo and the text "CLIMATE CHANGE" next to an illustration of a woman. Below the banner, the quiz title "Climate Change & Cities" is displayed, along with "22k plays - 92.4k players" and a description: "Do you know how cities deal with climate change? Get a front-row, ground-level seat, to the challenges cities... SHOW MORE". It is noted as "A public kahoot" and created by "naturelab" (updated 7 months ago). On the right, a "Log in to save results!" prompt offers "Log in", "Sign up", and "Continue as guest" options. Below this, the quiz questions are listed: 1. Quiz: "What is the difference between climate and weather?" (90 sec); 2. Slide: "Impacts of Climate Change"; 3. Quiz: "What are some of the impacts of climate change? Select all that apply." (30 sec). A "Show answers" button is visible at the top right of the question list.

<https://create.kahoot.it/details/a2d2d779-7aba-43e1-9541-333343744fb7>



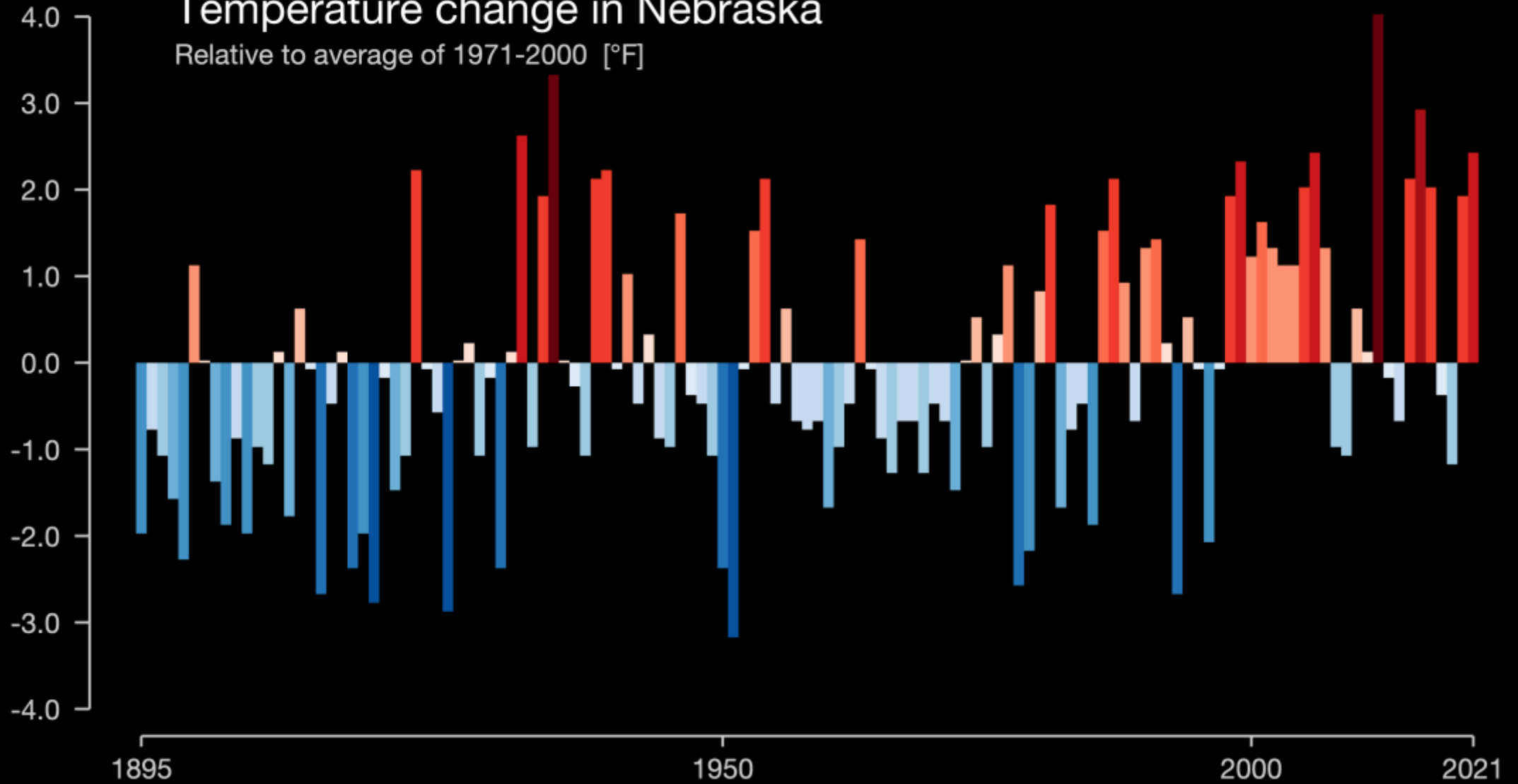
Temperature change in Pakistan

Relative to average of 1971-2000 [°C]



Temperature change in Nebraska

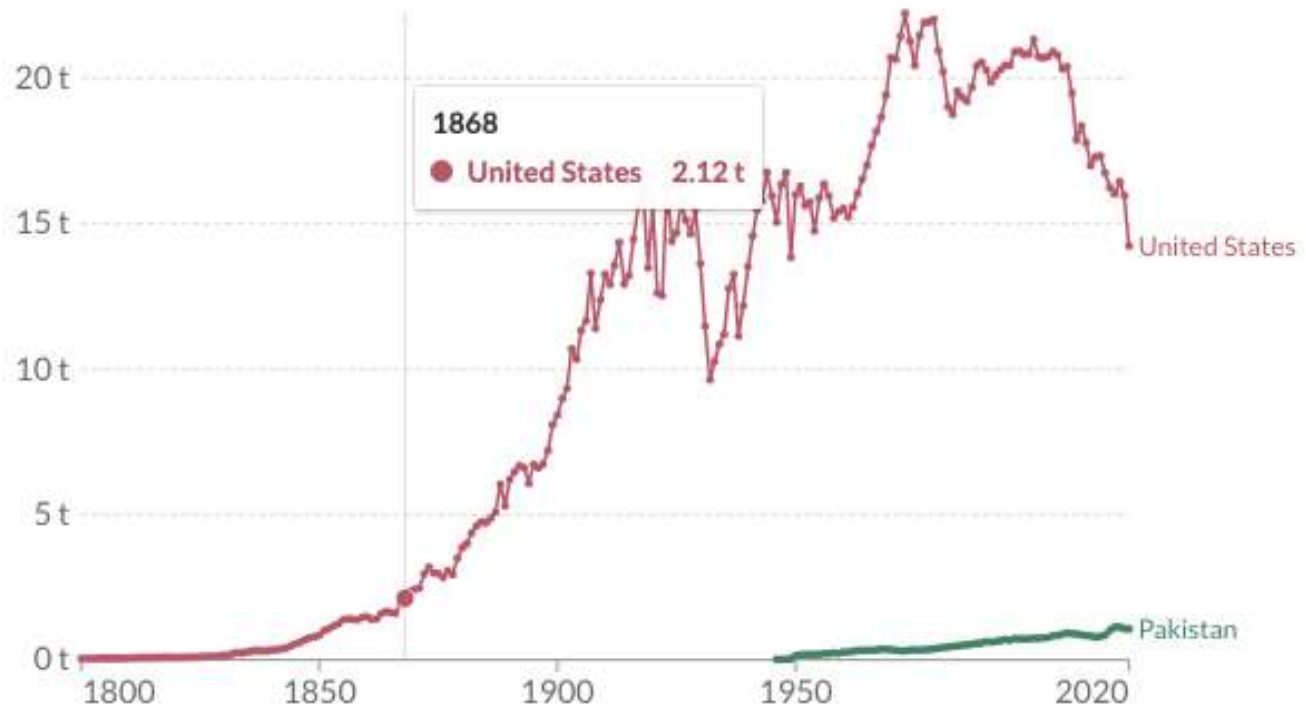
Relative to average of 1971-2000 [°F]



Per capita CO₂ emissions

Carbon dioxide (CO₂) emissions from fossil fuels and industry. Land use change is not included.

+ Add country Relative change



Source: Our World in Data based on the Global Carbon Project
OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY

▶ 1800 ○ 2020

CHART MAP TABLE SOURCES DOWNLOAD

Related: [CO₂ data: sources, methods and FAQs](#)

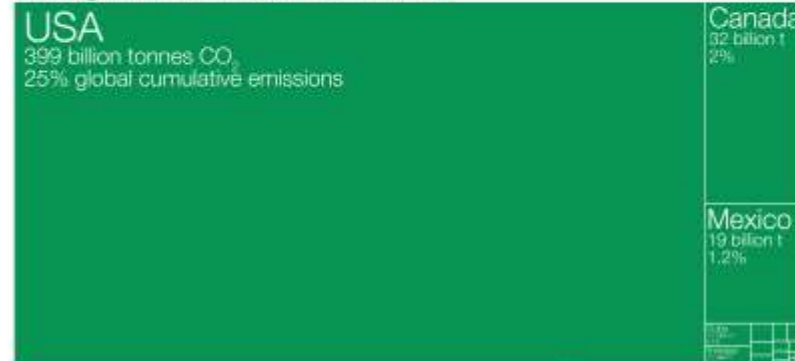


Who has contributed most to global CO₂ emissions?

Cumulative carbon dioxide (CO₂) emissions over the period from 1751 to 2017. Figures are based on production-based emissions which measure CO₂ produced domestically from fossil fuel combustion and cement, and do not correct for emissions embedded in trade (i.e. consumption-based). Emissions from international travel are not included.

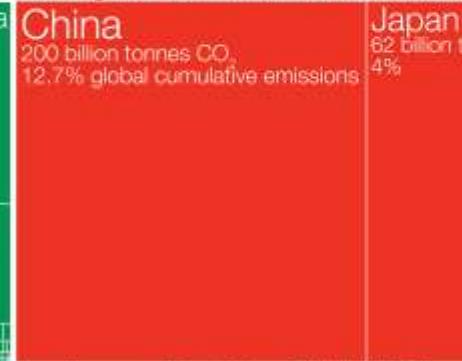
North America

457 billion tonnes CO₂
29% global cumulative emissions



Asia

457 billion tonnes CO₂
29% global cumulative emissions



EU-28

353 billion tonnes CO₂
22% global cumulative emissions

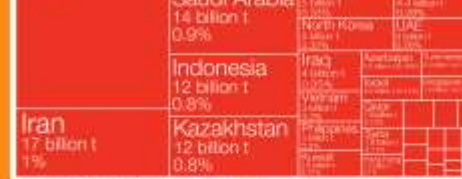


Russia

101 billion tonnes
6% global emissions

India

48 billion t
3%



Europe

514 billion tonnes CO₂
33% global cumulative emissions

Africa

43 billion tonnes CO₂
3% global emissions



South America

40 billion tonnes CO₂
3% global emissions



Oceania

20 billion tonnes CO₂
1.2% global emissions

Australia

17.4 billion t
1.1%

Figures for the 28 countries in the European Union have been grouped as the 'EU-28' since international targets and negotiations are typically set as a collaborative target between EU countries. Values may not sum to 100% due to rounding.

Data source: Calculated by Our World in Data based on data from the Global Carbon Project (GCP) and Carbon Dioxide Analysis Center (CDIAC). This is a visualization from OurWorldinData.org, where you find data and research on how the world is changing.

Licensed under CC-BY by the author Hannah Ritchie.





The Social Cost of Carbon

- Environmental Protection Agency uses this \$ figure to crack down on carbon emissions
 - It encompasses all the damages from crop failure, to lost wages, to flood damage, to climate-related deaths
 - Currently set at \$51/ton
 - Proposal to increase to \$190/ton
- The EPA performs a cost benefit analysis (CBA) for regulations/policies
 - More net benefits than costs, approve
 - Less net benefits than costs, do not approve

[LINK](#)



The Social Cost of Carbon

- The CBA estimates how much people will pay to reduce the cost of dying
 - EPA uses higher \$ amounts for deaths in higher incomes countries, lower \$ amounts for deaths in lower income countries
 - People with more money are more willing (or more able) to spend more
 - One death in the US has as much value as 55 deaths in Somalia

CLIMATE

Why the EPA puts a higher value on rich lives lost to climate change

February 8, 2023 · 5:00 AM ET

 Rebecca Hersher

A fire burns at a fossil fuel extraction site in Texas in 2021. The Environmental Protection Agency has proposed a new way to evaluate the cost to humanity of emitting greenhouse gases.

David Goldman/AP

[LINK](#)

The Social Cost of Carbon

- “A value that is too low means that we face excessive climate change risks, but a value that is too high imposes unwarranted emissions mitigation costs on the economy.”
 - Tamma Carleton, professor of economics at the School of Environmental Science and Management at UCSB

[LINK](#)

Comprehensive evidence implies a higher social cost of CO₂

[Kevin Rennert](#), [Frank Errickson](#), [Brian C. Prest](#), [Lisa Rennels](#), [Richard G. Newell](#), [William Pizer](#), [Cora Kingdon](#), [Jordan Wingenroth](#), [Roger Cooke](#), [Bryan Parthum](#), [David Smith](#), [Kevin Cromar](#), [Delavane Díaz](#), [Frances C. Moore](#), [Ulrich K. Müller](#), [Richard J. Plevin](#), [Adrian E. Raftery](#), [Hana Ševčíková](#), [Hannah Sheets](#), [James H. Stock](#), [Tammy Tan](#), [Mark Watson](#), [Tony E. Wong](#) & [David Anthoff](#) [✉](#)

Nature **610**, 687–692 (2022) | [Cite this article](#)

35k Accesses | **32** Citations | **1911** Altmetric | [Metrics](#)

Abstract

The social cost of carbon dioxide (SC-CO₂) measures the monetized value of the damages to society caused by an incremental metric tonne of CO₂ emissions and is a key metric informing climate policy. Used by governments and other decision-makers in benefit–cost analysis for over a decade, SC-CO₂ estimates draw on climate science, economics, demography and other disciplines. However, a 2017 report by the US National Academies of Sciences, Engineering, and Medicine¹ (NASEM) highlighted that current SC-CO₂ estimates no longer reflect the latest research. The report provided a series of recommendations for improving the

[LINK](#)



The Social Cost of Carbon

- Noah Kaufman, Senior Research Scholar at Columbia, argues that the cost benefit analysis isn't appropriate within the context of carbon emissions:
 - “Climate damages will disproportionately affect those who cannot afford to prepare or respond (US Global Change Research Program 2018), so a metric that is disproportionately influenced by the preferences of wealthy individuals can mislead policy makers about the scale and scope of the climate challenge.”



[LINK](#)



The Social Cost of Carbon

Greenhouse gas emissions

This article is more than 1 year old

Three Americans create enough carbon emissions to kill one person, study finds

The analysis draws on public health studies that conclude that for every 4,434 metric tons of CO₂ produced, one person globally will die

Oliver Milman
@olmilmann
Thu 29 Jul 2021 05:00 EDT



New research has found that just three Americans will create enough planet-heating emissions to kill one person. Photograph: Dane Rhyu/Reuters

The lifestyles of around three average Americans will create enough planet-heating emissions to kill one person, and the emissions from a single coal-fired power plant are likely to result in more than 900 deaths, according to the first analysis to calculate the mortal cost of carbon emissions.

The new research builds upon what is known as the “social cost of carbon”, a monetary figure placed upon the damage caused by each ton of carbon dioxide emissions, by assigning an expected death toll from the emissions that cause the climate crisis.

The analysis draws upon several public health studies to conclude that for every 4,434 metric tons of CO₂ pumped into the atmosphere beyond the 2020 rate of emissions, one person globally will die prematurely from the increased temperature. This additional CO₂ is equivalent to the current lifetime emissions of 3.5 Americans.

- “The lifestyles of around three average Americans will create enough planet-heating emissions to kill one person, and the emissions from a single coal-fired power plant are likely to result in more than 900 deaths...”

[LINK](#)



Vulnerability

- “set of conditions determined by physical, social, economic and environmental factors or processes that increase the susceptibility of a community to the impact of hazards” (United Nations, 2005)
- Vulnerability is NOT simply a result of environmental extremes or events! It is rooted in the social space of everyday life.



Vulnerability

- 2004 Asian Tsunami
 - Women were more vulnerable to drowning (due to social customs women were less likely to know how to swim)
- Inequalities in gender roles gave women less access to social resources and decision-making processes
 - Made it more difficult to weather and recover from the disaster



Vulnerability

- Hazards are not purely “natural” events
- Political, economic, cultural and environmental processes interact at multiple scales to create different types and levels of vulnerability

WORLD NEWS JUNE 14, 2022 / 12:08 AM / UPDATED 4 MONTHS AGO

In hottest city on Earth, mothers bear brunt of climate change

By Charlotte Greenfield, Gloria Dickie

9 MIN READ



JACOBABAD, Pakistan (Reuters) - Heavily pregnant Sonari toils under the burning sun in fields dotted with bright yellow melons in Jacobabad, which last month became the hottest city on Earth.



[LINK](#)



Climate Reparations

- “The enormity of this climate-induced catastrophe is beyond our fiscal means,” he said. “This is about climate justice.”
 - Pakistan’s Prime Minister Shehbaz Sharif

The U.S. and EU fear that such compensation might expose them to legal challenge for their culpability for climate change.

[LINK](#)



Women and children evacuate their flooded homes in Sindh Province, Pakistan on September 6, 2022. FARZED KHAN / AP PHOTO

ANALYSIS

As UN Climate Talks Near, a Showdown on Reparations Looms

Developing nations have pushed demands that rich nations provide compensation for climate-caused “loss and damage” atop the agenda for next month’s climate conference in Egypt. With the U.S. and EU resisting, analysts say this key issue must be addressed if COP27 is to be a success.

BY FRED PEARCE · OCTOBER 20, 2022



27th UN Climate Change Conference

COP27 establishes loss and damage fund to respond to human cost of climate change

Deal on compensation for climate impacts represents major milestone for climate justice.

The 27th UN Climate Change Conference (COP27) has ended with an historic deal to create a new fund, in which countries responsible for high carbon emissions will compensate vulnerable countries suffering from climate impacts.

"Creating the loss and damage fund is a first, important step. It is

from 3-5-12 billion US dollars today to US\$20 billion per year by 2030.

"What can't be mitigated or adapted to, will be suffered," said Patricia Schwerdtle, a Climate Advisor to Doctors Without Borders. "This suffering will be endured disproportionately by people living in poverty, excluded from health care,

issue remained superficial and highly technical. The Paris Agreement itself includes a provision on loss and damage (Article 8) but was carefully worded to not include any liability or compensation—a condition put forward by the USA at the time.

At COP25 in 2019 in Madrid, a grouping of 134 developing countries—



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December 8, 2022

[https://doi.org/10.1016/S2542-5396\(22\)00331-X](https://doi.org/10.1016/S2542-5396(22)00331-X)

For more on the IFRC Cost of Doing Nothing report see <https://www.ifrc.org/es/media/48881>

For more on the Santiago Network see <https://unfccc.int/santiago-network>

“The 27th UN Climate Change Conference (COP27) has ended with an historic deal to create a new fund, in which countries responsible for high carbon emissions will compensate vulnerable countries suffering from climate impacts.”

Source: [The Lancet](#)



27th UN Climate Change Conference

- “What can't be mitigated or adapted to, will be suffered,” said Patricia Schwerdtle, a Climate Advisor to Doctors Without Borders. “This suffering will be endured disproportionately by people living in poverty, excluded from health care, and those living in fragile and conflict-affected states.”
- “The loss and damage fund is a response to climate injustice and climate debt, owed by the rich countries to the poor,” added Meena Raman, Head of Programmes at Third World Network.
- “...strong leadership by Pakistan in rallying the group (G77), led to the inclusion of finance for loss and damage on the COP27 agenda, and the eventual adoption of a loss and damage fund.”

[Source: The Lancet](#)



27th UN Climate Change Conference

- “How will the fund be structured?”
- Who will pay into it?
- How much will be paid?
- Who will manage it?
- Who will be eligible to receive funds?”
- “These questions will be addressed by a 24-member Transitional Committee, tasked to come up with a proposal by COP28 in December, 2023.”
- The fund is expected to become operational by December, 2023

Source: The Lancet



Unequal Access to Information

- “Islamabad’s newfound leverage at U.N. climate negotiations does not automatically translate to local-level mobilization. This is partially because much of the discourse of the global climate movement remains inaccessible to the average Pakistani, who has limited media access and is not fluent in English.”
- “The disconnect between the Pakistani leadership and public has left the country extremely vulnerable to climate change, as effective climate action requires everyday citizens to be invested and involved.”

REPORT

Pakistan's Climate Disconnect

The country's growing leverage at U.N. negotiations has not resonated with much of its population.

By [Anmol Irfan](#)



Children internally displaced by Pakistan's floods attend a mobile school class near a makeshift camp in Dera Allah Yar on Jan. 9. FDA HUSSAIN/AFP VIA GETTY IMAGES

Expert analysis for the global reader. [View membership options.](#)

FEBRUARY 17, 2023, 10:42 AM

In mid-March 2022, [Innovate Educate & Inspire Pakistan \(IEI\)](#), a nonprofit organization that works to make high-quality education accessible in the rural northeastern Gilgit Baltistan region, launched

[LINK](#)



Poverty & Climate Change

- Climate change exacerbates poverty
- People living in poverty face disproportionate impacts of climate change
- What is the impact of poverty eradication on emissions and climate change?
- Is bringing people out of poverty going to have a significant rise in emissions such that we cannot mitigate climate change?



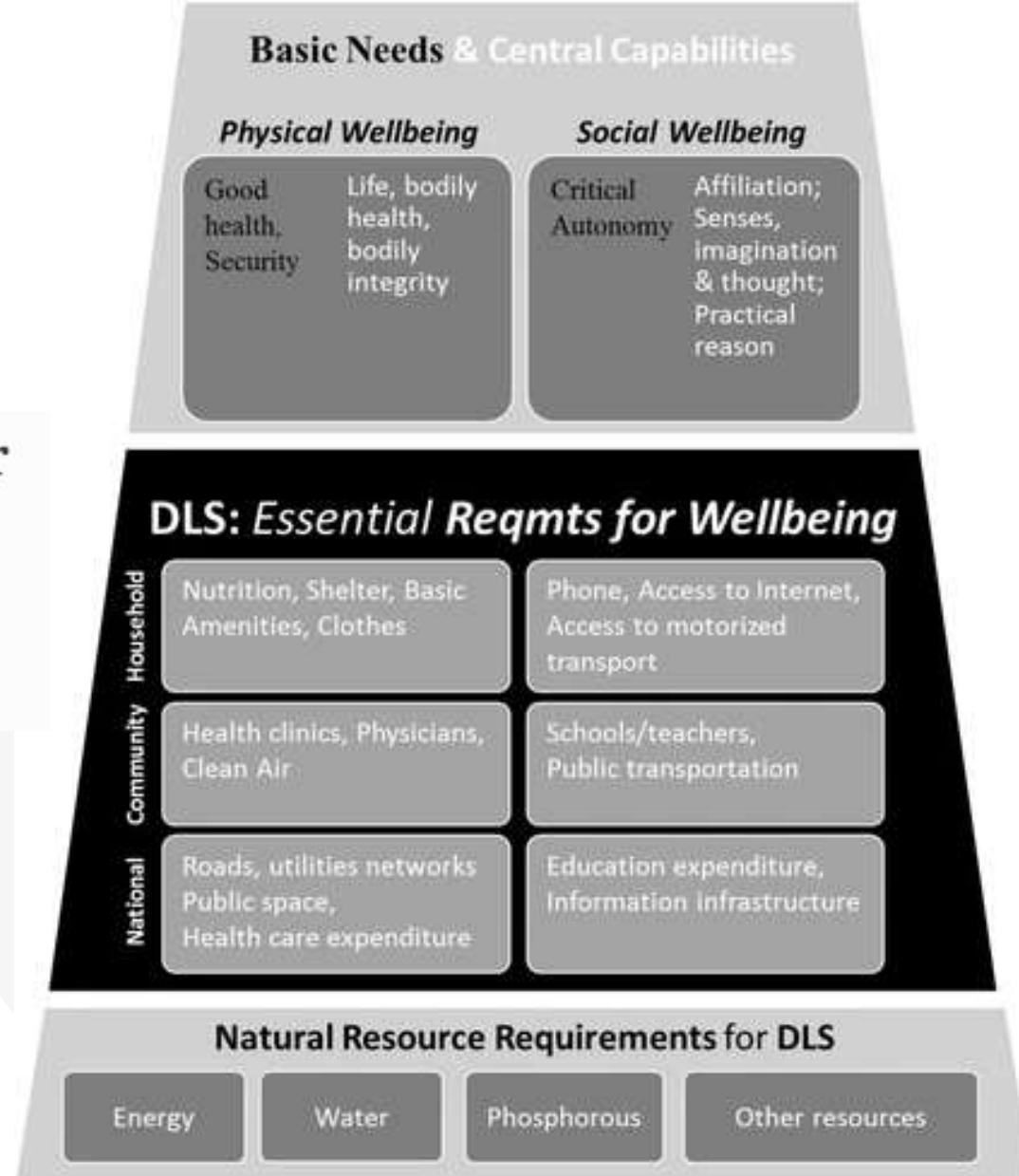
Poverty & Climate Change

Decent Living Standards: Material Prerequisites for Human Wellbeing

[Narasimha D. Rao](#) & [Jihoon Min](#)

Social Indicators Research **138**, 225–244 (2018) | [Cite this article](#)

Rao, N.D., Min, J. Decent Living Standards: Material Prerequisites for Human Wellbeing. *Soc Indic Res* **138**, 225–244 (2018). <https://doi.org/10.1007/s11205-017-1650-0>



Poverty & Climate Change



Global Environmental Change

Volume 65, November 2020, 102168



Providing decent living with minimum energy: A global scenario

[Joel Millward-Hopkins](#)^a  , [Julia K. Steinberger](#)^{a, b}, [Narasimha D. Rao](#)^{c, d}, [Yannick Oswald](#)^a



Highlights

- Providing Decent Living with Minimum Energy: A Global Scenario.
- As ecological breakdown looms, the basic material needs of billions remain unmet.
- We estimate the minimal energy for providing decent living globally & universally.
- Despite population growth, 2050 global energy use could be reduced to 1960 levels.
- This requires advanced technologies & reductions in demand to sufficiency levels.
- But 'sufficiency' is far more materially generous than many opponents often assume.

<https://www.decentlivingenergy.org/>



Developing the Next Generation of Female Environmentalists

UNIVERSITY OF
Nebraska
Omaha

Poverty & Climate Change

- There is an immediate need to build infrastructure and provide services
- Requires a transformation of economies with new technologies
 - Challenge: The poorest countries have the highest cost of capital



Poverty & Climate Change

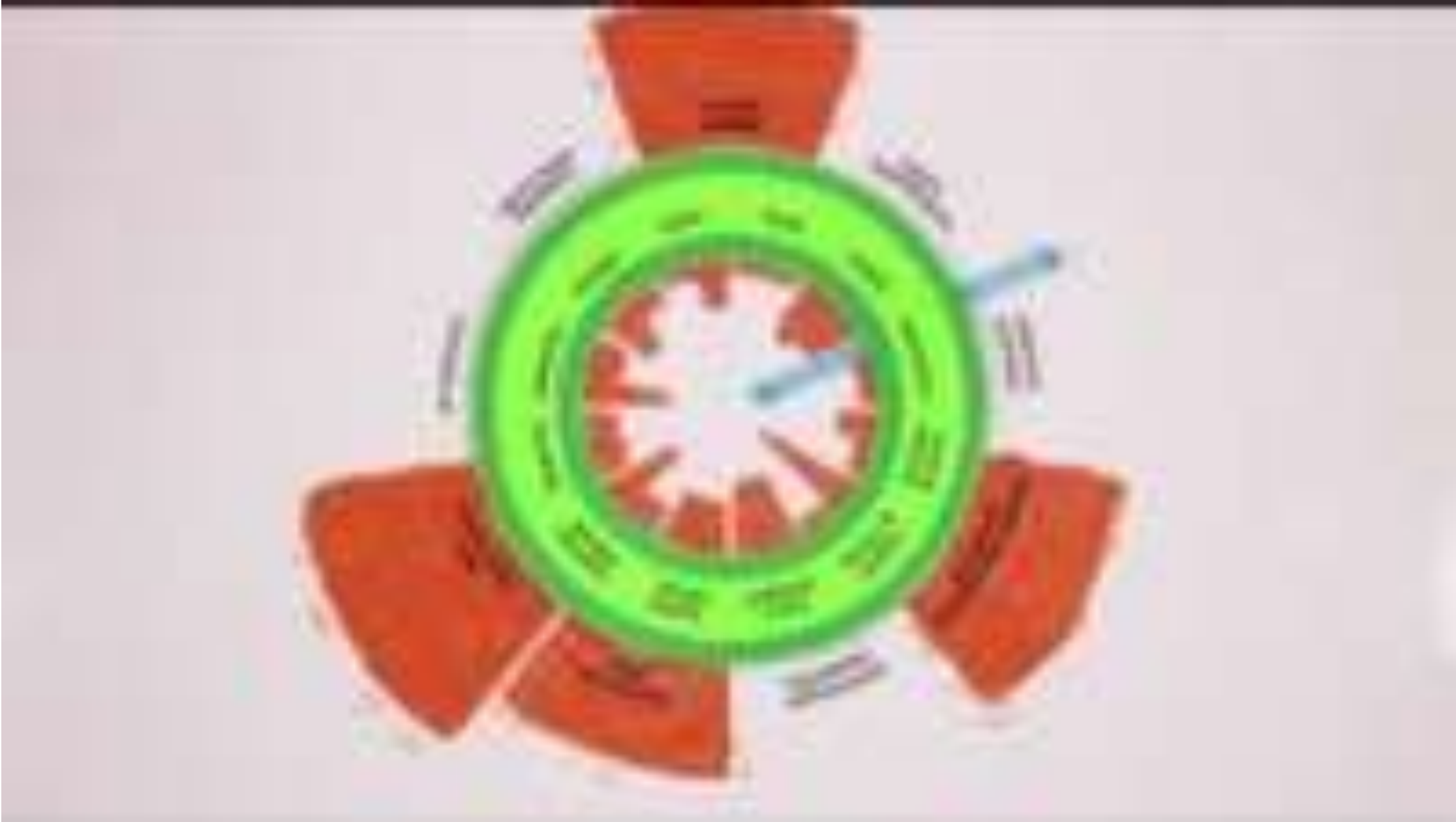
- Embed climate change policy within all development planning
 - Shared mobility vs. car dependency
 - Low energy diets



Ugandan university lecturer and cycling enthusiast Amanda Ngabirano on her bicycle

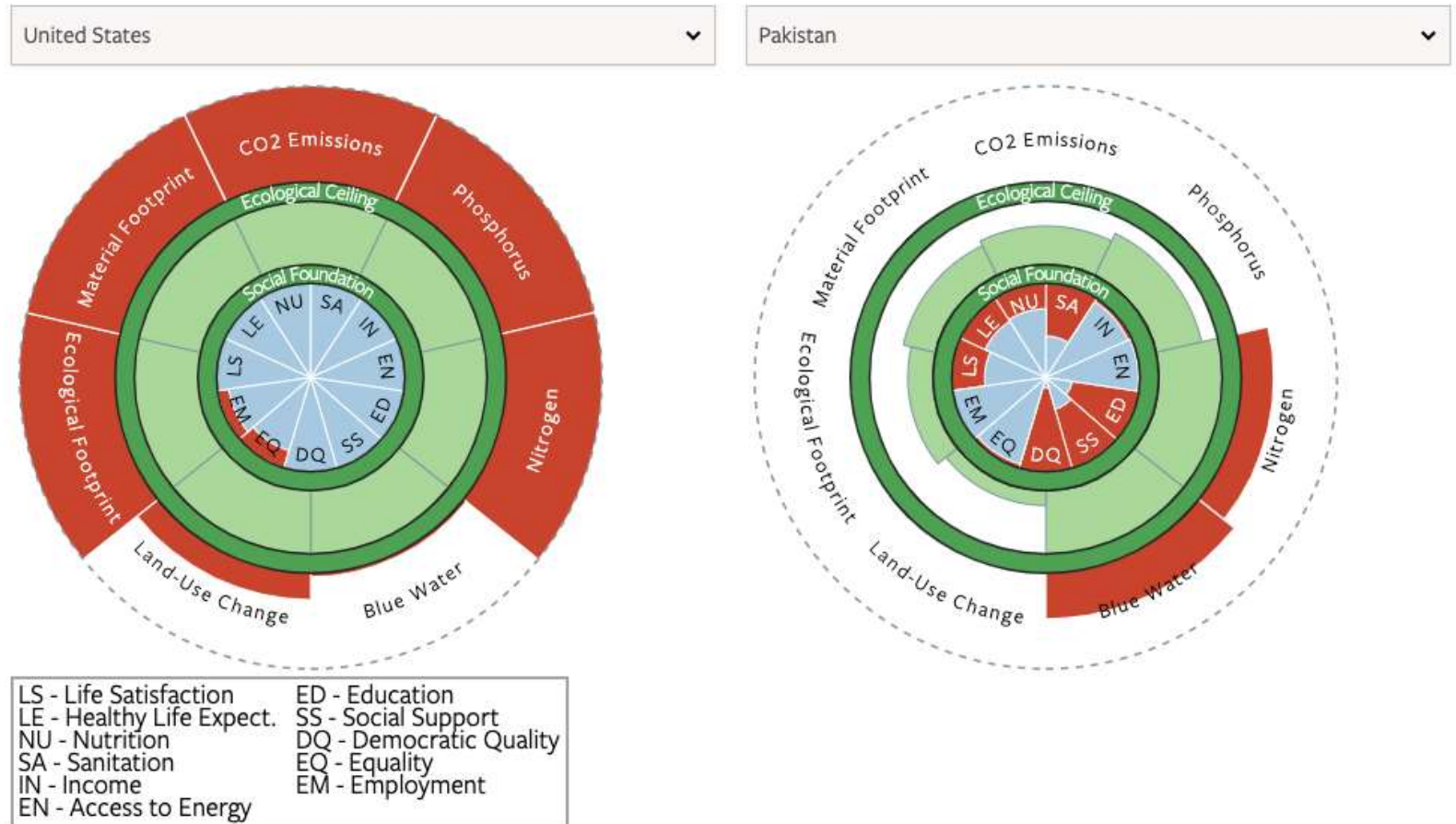
[Amanda Ngabirano]





“A Good Life For All Within Planetary Boundaries”

- Country Comparisons



What is a Just Transition?

- Arguments against the Kyoto Protocol emphasized the fact developing nations were exempt
- Today, the opposite argument is made that the Global South should be allowed to develop fossil fuel industries and carbon-intensive development



What is a Just Transition?

- Electric vehicle batteries currently utilize cobalt
- Mining is done in countries where labor and environmental laws are limited
- Cobalt mining in the Democratic Republic of the Congo is harming individuals who will never drive an EV

Global development

Analysis

How the race for cobalt risks turning it from miracle metal to deadly chemical

Jonathan Watts

As a case in the US alleges links between tech companies and child miners in Congo, the Guardian's global environment editor assesses the dangers of element in high demand for batteries

Global development is supported by

BILL & MELINDA GATES foundation

About this content

Wed 18 Dec 2019 03:00 EST



A woman and child break rocks at a copper quarry and cobalt pit in Lubumbashi, DRC. Photograph: Junior Kannah/Getty

If the prophets of technology are to be believed, the best hope for solving the climate crisis is ever more **efficient batteries**. But the race to produce enough materials for this energy-storage revolution is creating a host of other environmental problems, as cobalt-producing nations like the Democratic Republic of the Congo, Zambia and Cuba are discovering.

[LINK](#)



What is a Just Transition?

- Options exist:
 - Improve safety of working conditions
 - Manufacture batteries without cobalt
 - Don't repeat the same tragedies in these supply chains as were/are present in fossil fuel supply chains
- Keep the supply chain wholly in the US where environmental and labor laws exist
 - OR-
 - more of the supply chain exists in the mining countries, thus ensuring greater economic benefits, while enforcing environmental and labor policies



What is a Just Transition?

- Options exist:
 - Invest in domestic recycling and create a circular economy so more mining isn't necessary
 - What policies/subsidies are needed?
 - Reduce material demand
 - Decrease the need for cars by investing in public transit and urban planning that doesn't center cars




Eric Sehr (CC BY-SA 2.0)



Climate Migrants

- “...the world has yet to officially recognize climate migrants or come up with formalized ways to assess their needs and help them.”

AP U.S. News World News Politics Sports Entertainment Business Technology Health Science Oddities



Climate migration growing but not fully recognized by world

By JULIE WATSON
July 28, 2022

[f](#) [t](#) [e](#) [p](#)

TIJUANA, Mexico (AP) — Worsening climate largely from the burning of coal and gas is uprooting millions of people, with wildfires overrunning towns in California, rising seas overtaking island nations and drought exacerbating conflicts in various parts of the world.

Each year, natural disasters force an average of 21.5 million people from their homes around the world, according to the U.N. High Commissioner for Refugees. And scientists predict migration will grow as the planet gets hotter. Over the next 30 years, 143 million people are likely to be uprooted by rising seas, drought, searing temperatures and other climate catastrophes, according to the U.N.'s Intergovernmental Panel on Climate Change report published this year.

[LINK](#)



Climate Migrants



Climate Colonialism

- Solar geoengineering has been pitched to cool the atmosphere
- “As a climate expert, I consider these environmental manipulation techniques extremely risky. And as an African climate expert, I strongly object to the idea that Africa should be turned into a testing ground for their use.”
- An American startup, Make Sunsets, launched balloons from Mexico to inject sulfur into the atmosphere
 - The Mexican government was unaware of the exercise until after the fact



Climate Colonialism

- “The technologies are potentially dangerous, and a major distraction from the real change that we all know wealthier nations need to make if we have a hope of outrunning climate devastation.”



Inflation Reduction Act of 2022

- Significant focus on environmental justice
 - pollution reduction
 - affordable and accessible clean energy for disadvantaged communities
 - employment with livable wages

- “Through the Inflation Reduction Act, EPA will improve the lives of millions of Americans by reducing pollution in neighborhoods where people live, work, play, and go to school; accelerating environmental justice efforts in communities overburdened by pollution for far too long; and tackling our biggest climate challenges while creating jobs and delivering energy security.”

[LINK](#)



Local Climate Justice

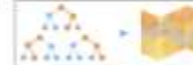


Omaha Heat Campaign Report

After months of collaboration, local organizers and volunteers collected thousands of temperature and humidity data points on August 6, 2022.

Resulting from a data-collection campaign over three time points (morning, afternoon and evening) on a hot summer day, measurements summarized in this report are a snapshot of how temperature and humidity vary across neighborhoods in an urban environment based on the landscape.

Thanks to all the participants and organizers of the Urban Heat Watch Project in Omaha, NE.



We combined heat and land cover data to predict temperatures in each time period. However, due to technical issues with temperature sensors and possible field issues, data could not be retrieved from several regions.



Temperature changes are indicated in color on the maps below. Warmer areas are more red and cooler areas are more blue.

Aug. 6, 2022	80 mi²	68	8	43,714	102.9°	9.4°
Study Date	Study Area	Volunteers	Routes	Measurements	Max Temp.	Temperature Differential



Morning Routes (6-7 a.m.)
Over 14,000 unique temperature measurements are displayed on this portion of our study area. Temperatures vary from coolest (77.4°F) to warmest (81.4°F).



Afternoon Routes (1-2 p.m.)
Over 13,000 unique temperature measurements are displayed on this portion of our study area. Temperatures vary from coolest (94.8°F) to warmest (102.9°F).



Evening Routes (7-8 p.m.)
Over 15,000 unique temperature measurements are displayed on this portion of our study area. Temperatures vary from coolest (93.8°F) to warmest (102.9°F).

Contact: Abdoulaziz Abdoulaye at Abdoulaziz.abdoulaziz@unmc.edu

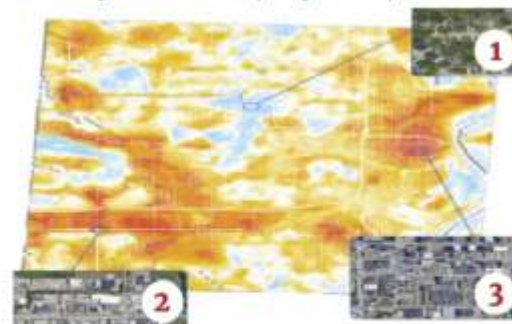


Local Climate Justice



Conclusions

The distribution of heat across a region often varies by the way land is used. Below are some examples of how changes in land use are impacting urban temperatures.



1. Residential areas with a high tree cover retain less heat throughout the day and have cooler temperatures.

2. Areas with a high density of industrial land use can retain more heat.

3. Large swaths of asphalt in commercial areas can retain more heat and result in higher temperatures.

Next Steps

The Urban Heat Watch Project is the first step to better understanding temperature distribution in Omaha. As extreme heat exposure poses a risk to human health, we can use this information to make informed decisions to reduce risks in our community. Opportunities to mitigate heat exposure include:

- Prioritize health equity
- Community engagement and empowerment
- Invest in urban parks and interactive water features
- Transform small areas into green spaces
- Convert recreational areas into greener spaces
- Invest in tree canopies along contiguous streets and in parks
- Leverage existing cool spaces through joint-use agreements

Learn More

Please visit [the UNMC Water, Climate and Health Program website](#) to learn more about this project.



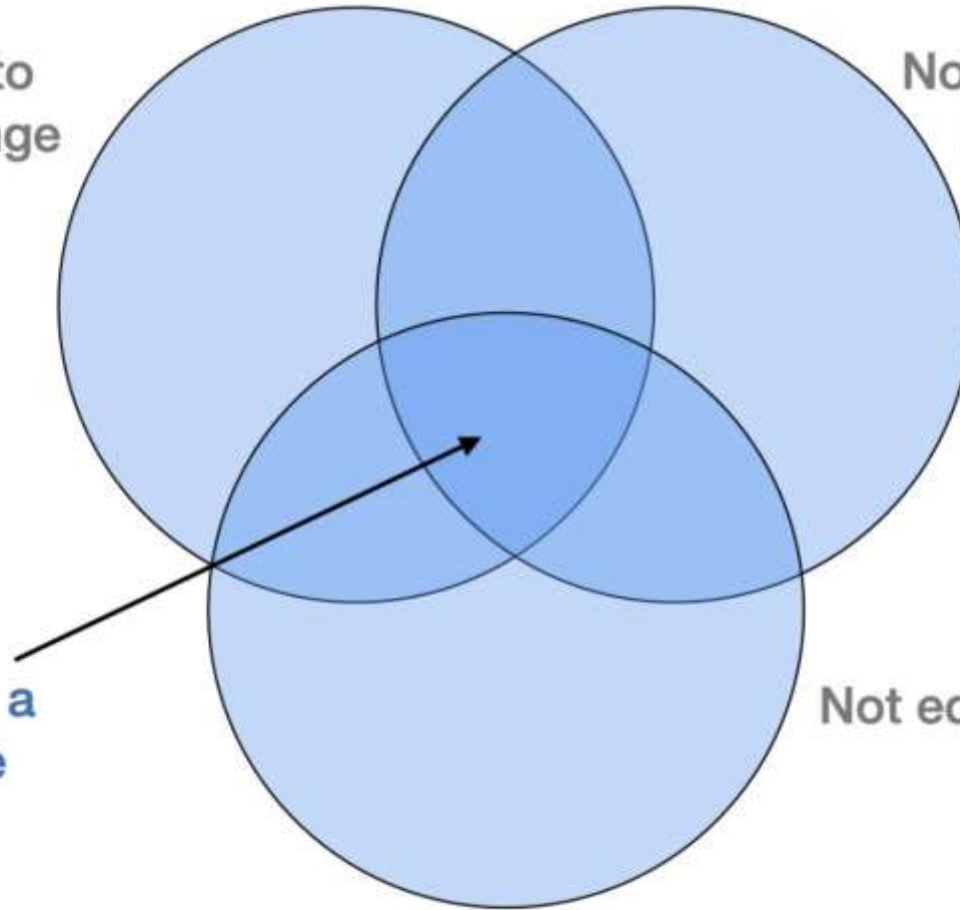
*We acknowledge Umo'ho Nation People.

Contact: Abdoulaziz Abdoulaye at Abdoulaziz.abdoulaziz@unmc.edu



Needs to be rebuilt to address climate change

Not good for health and well-being anyway



The space to create a safe and just future

Not equitable

@bethsawin



Questions & Discussion



UNIVERSITY OF
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