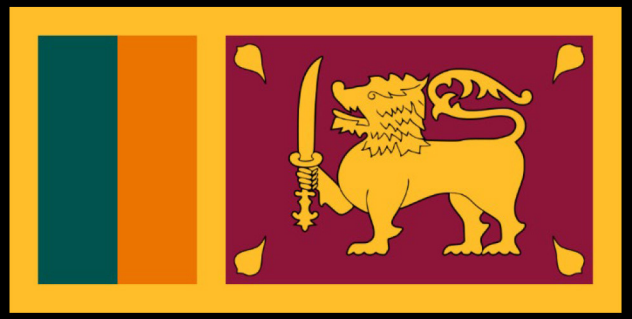


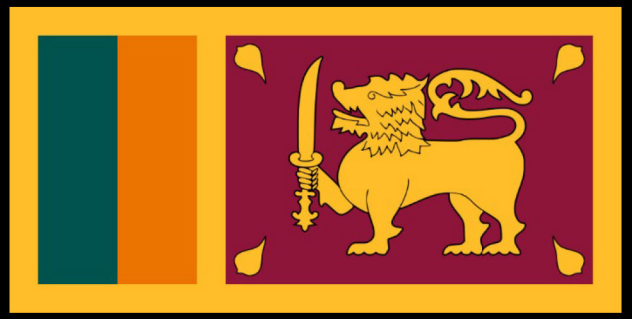
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The Ceylon Chamber of Commerce

The Identification of Climate Threats to Sri Lanka –

Implementation of Adaptation Measures

Rohan Pethiyagoda



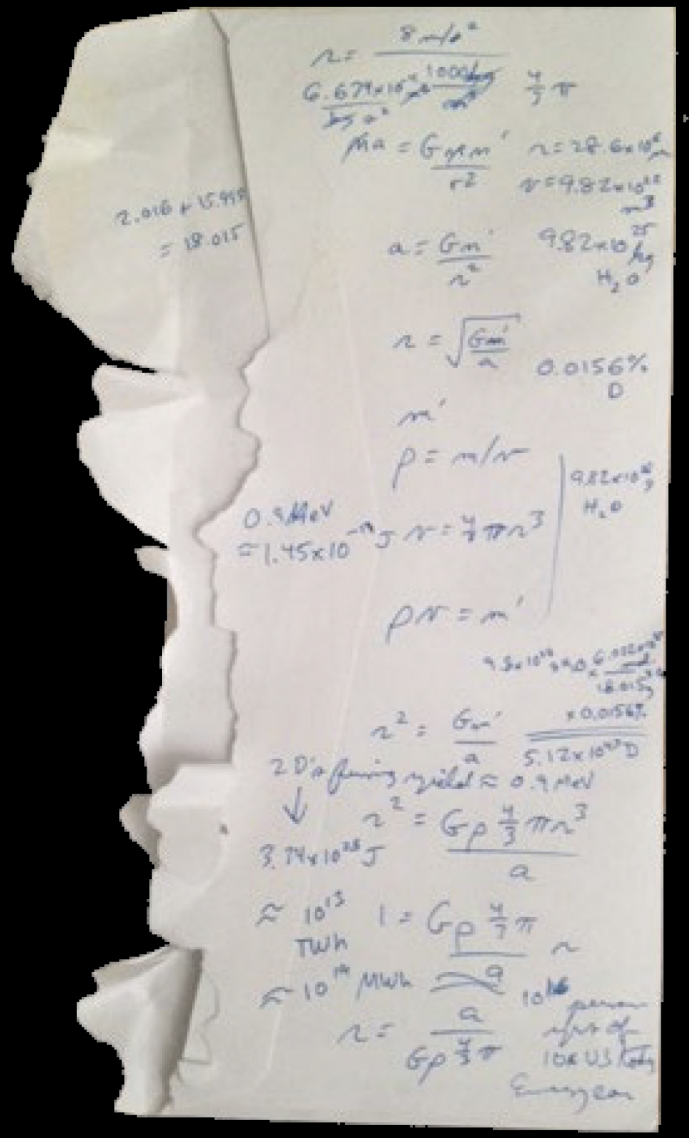
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Climate Change:

A 'Back-of-Envelope' Response

Rohan Pethiyagoda



Climate Change 2023
Synthesis Report

These Sections should be cited as:
IPCC, 2023: Sections. In: *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-9789291691647

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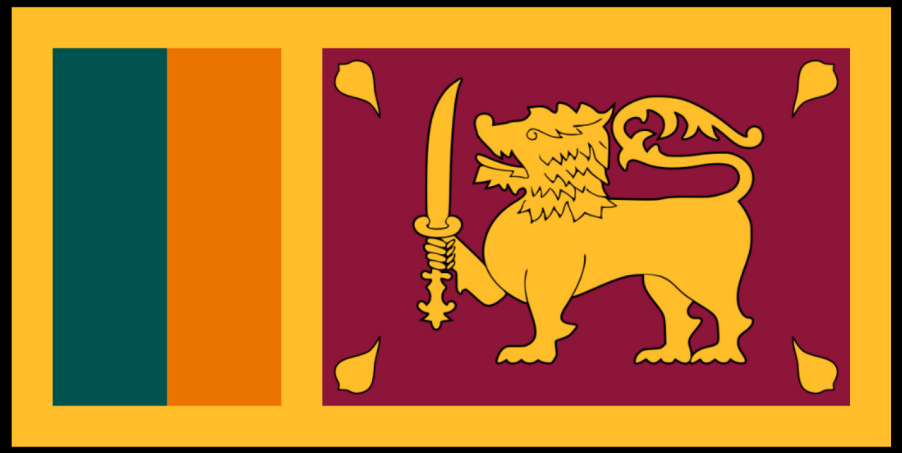
ipcc

INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

Representative Concentration Pathways

Effort to curb emissions	Energy generation	New technology	Transport		Temperature 2081–2100 (average increase relative to 1986-2005)	Sea level 2081–2100 (average rise relative to 1986-2005)	Extreme weather 2081–2100	Adaptation required
Low	Coal-fired power		Cars, trucks	RCP 8.5	3.7 °C	0.63 m	**Large** increase	High level at high cost
Medium	Mix		Mix	RCP 6.0	2.2 °C	0.48 m	**Moderate** increase	Medium level at medium cost
Medium	Renewable		Mix	RCP 4.5	1.8 °C	0.47 m	**Moderate** increase	Medium level at medium cost
High	Renewable	Emissions capture	Bicycles, public transport	RCP 2.6	1.0 °C	0.4 m	**Small** increase	Low level at low cost



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(1) Address the Threats

(2) Be a Good Global Citizen

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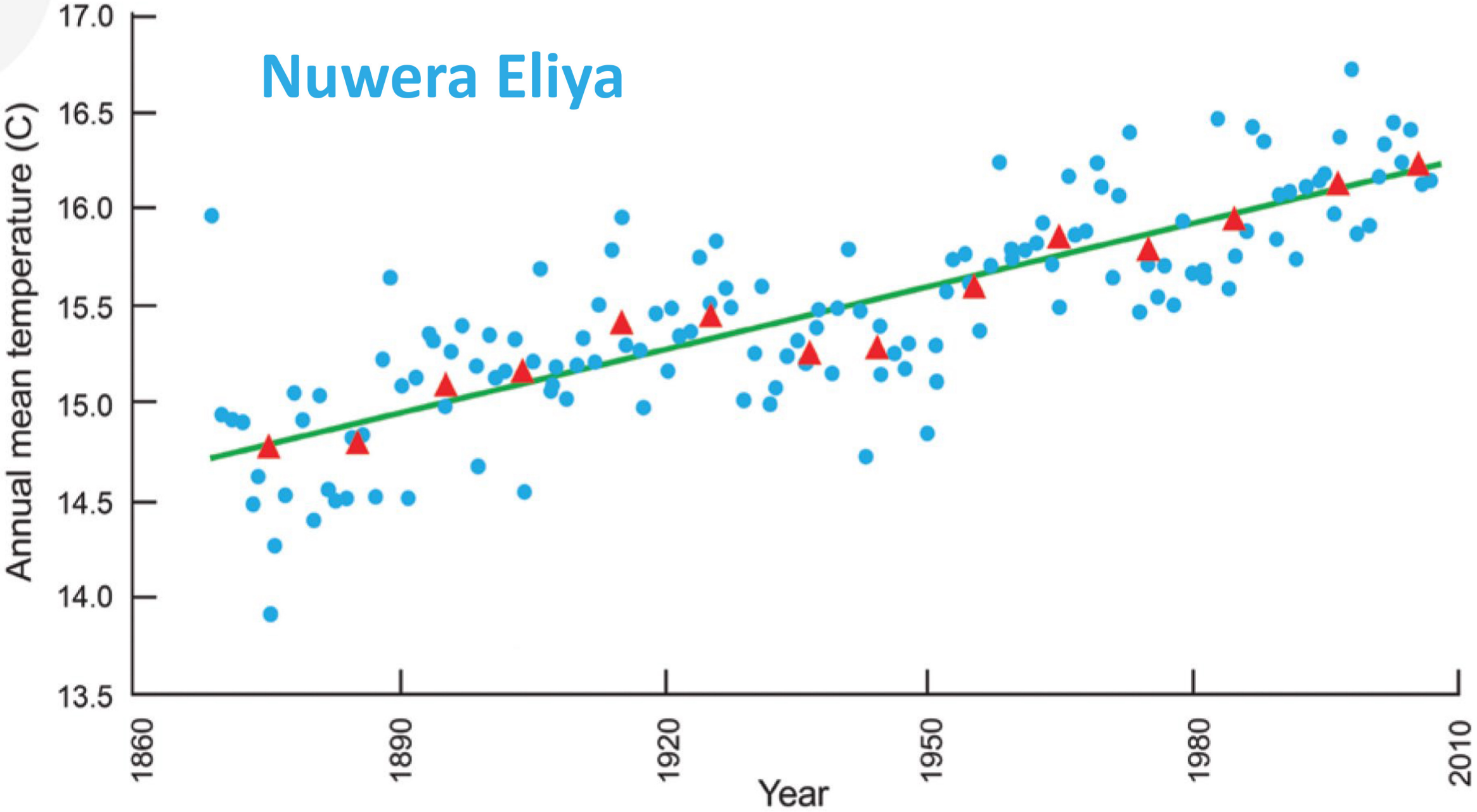
THE THREATS

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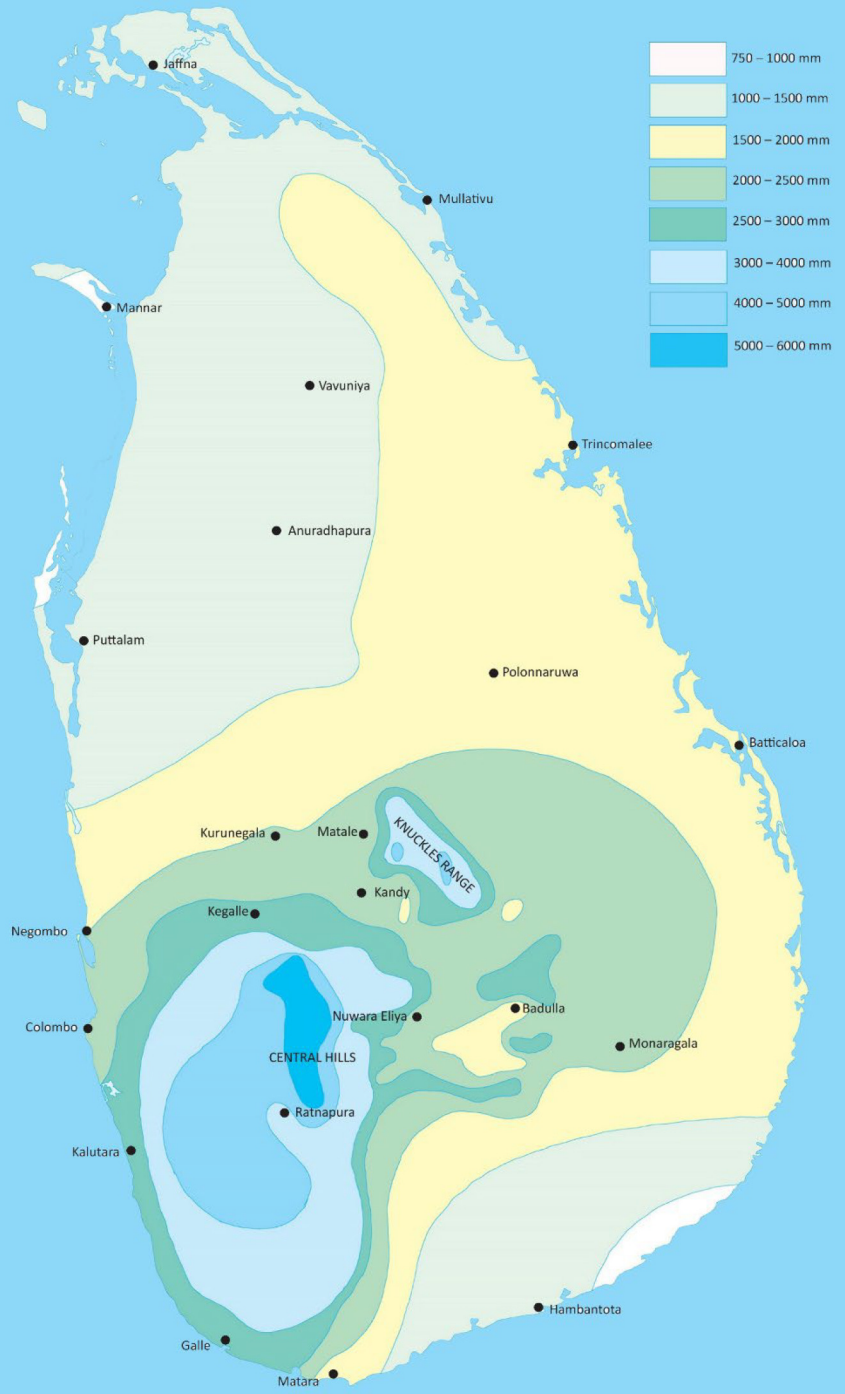
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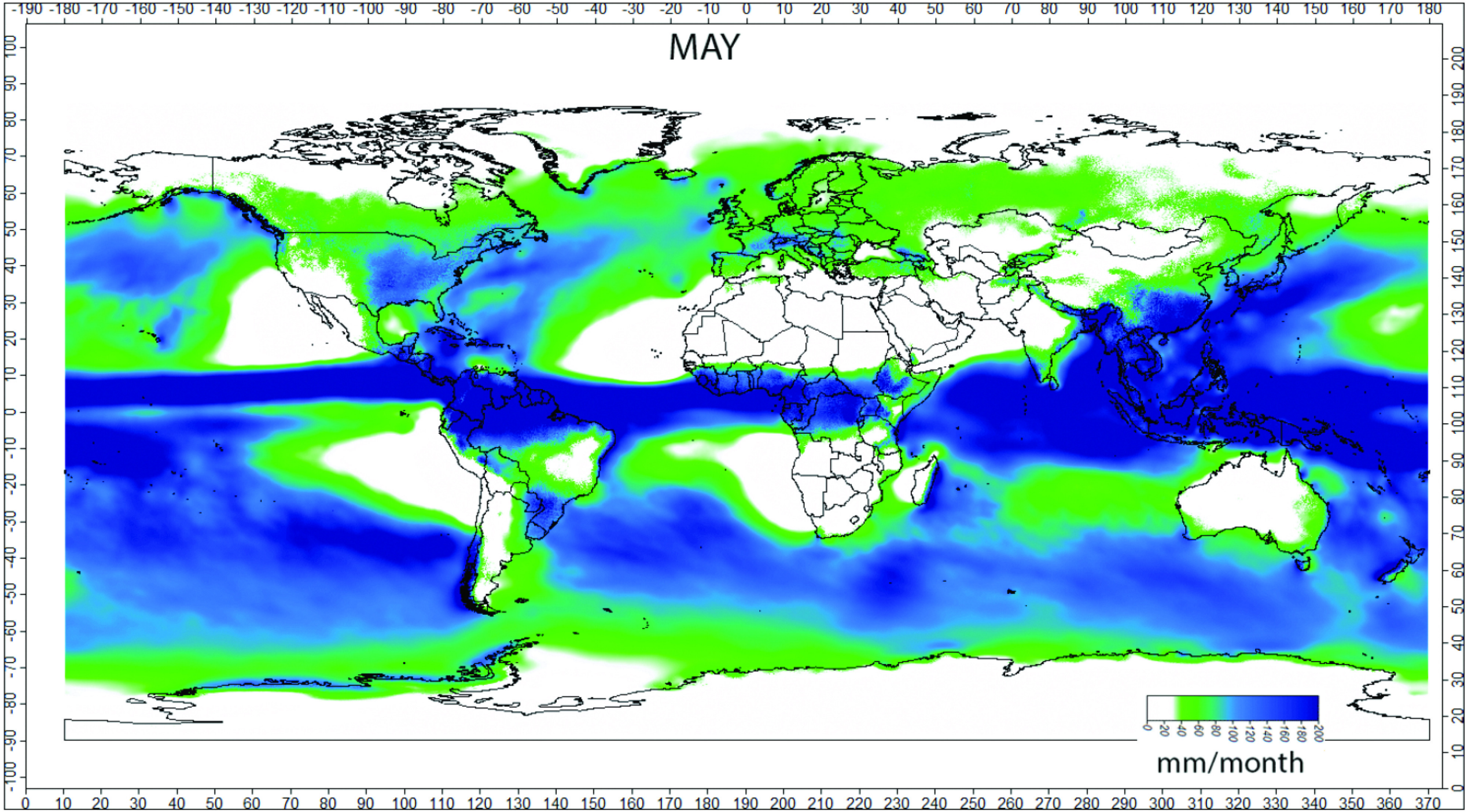
- Rising temperature
- Changing rainfall
- Rising sea level
- More extreme weather events

Nuwera Eliya

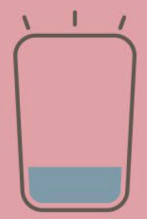
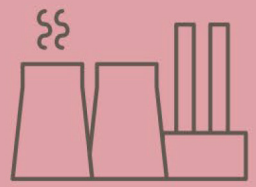
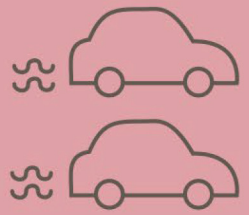
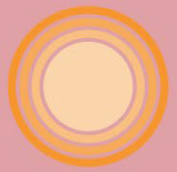


De Costa, W. A. J. M., **2008**. Climate change in Sri Lanka: myth or reality? Evidence from long-term meteorological data. *Journal of the National Science Foundation of Sri Lanka*, 36: 63–88


750 – 1000 mm
1000 – 1500 mm
1500 – 2000 mm
2000 – 2500 mm
2500 – 3000 mm
3000 – 4000 mm
4000 – 5000 mm
5000 – 6000 mm
Jaffna
Mullativu
Mannar
Vavuniya
Trincomalee
Anuradhapura
Puttalam
Polonnaruwa
Batticaloa
Kurunegala
Matale
KNUCKLES RANGE
Kandy
Kegalle
Negombo
Nuwara Eliya
Badulla
Colombo
Monaragala
CENTRAL HILLS
Ratnapura
Kalutara
Hambantota
Galle
Matara

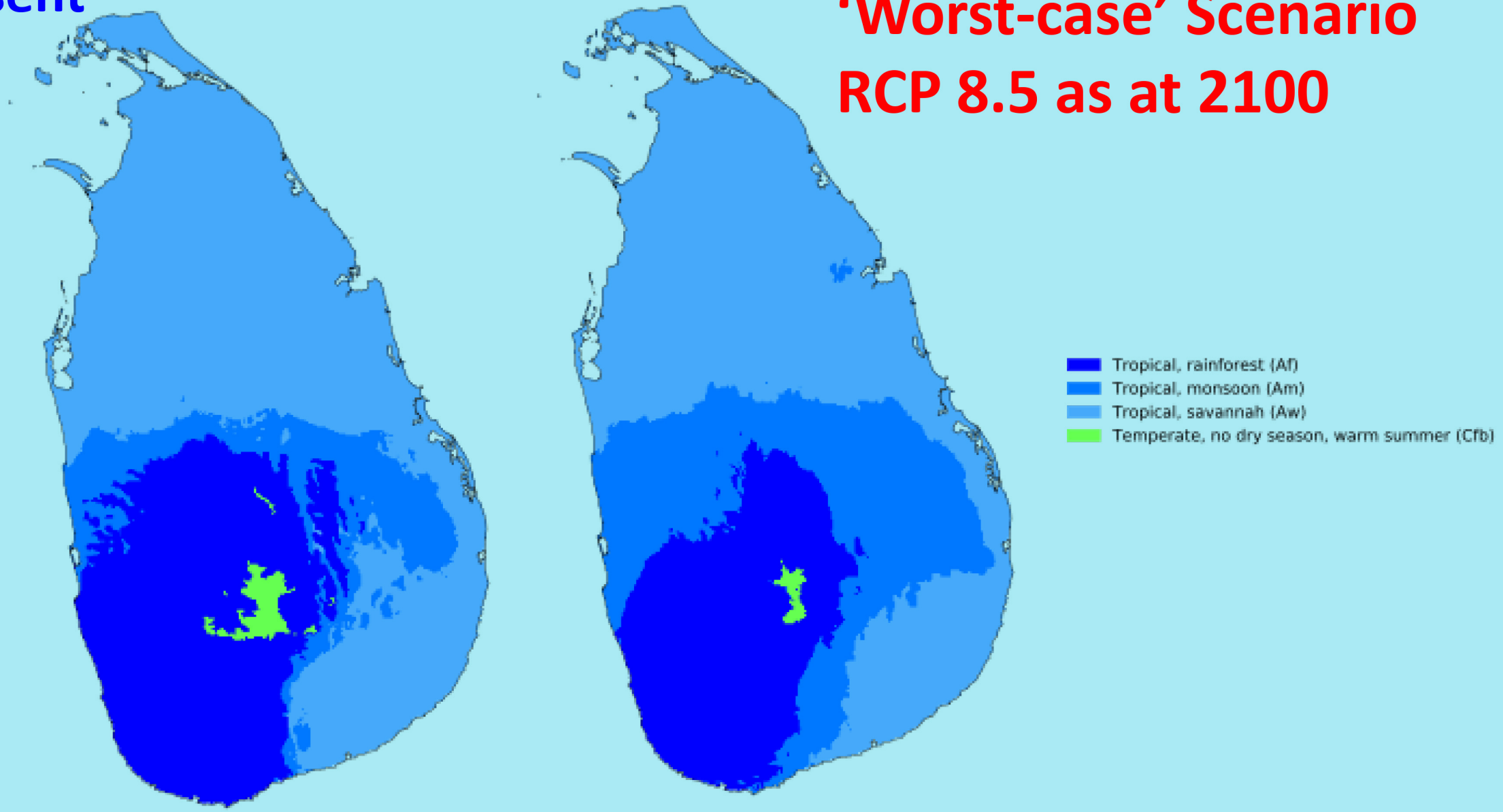

MAY
0 20 40 60 80 100 120 140 160 180 200
mm/month

Representative Concentration Pathways

Effort to curb emissions	Energy generation	New technology	Transport		Temperature 2081–2100 (average increase relative to 1986-2005)	Sea level 2081–2100 (average rise relative to 1986-2005)	Extreme weather 2081–2100	Adaptation required
				RCP 8.5				
Low	Coal-fired power		Cars, trucks		**3.7 °C**	**0.63 m**	**Large** increase	High level at high cost

At Present

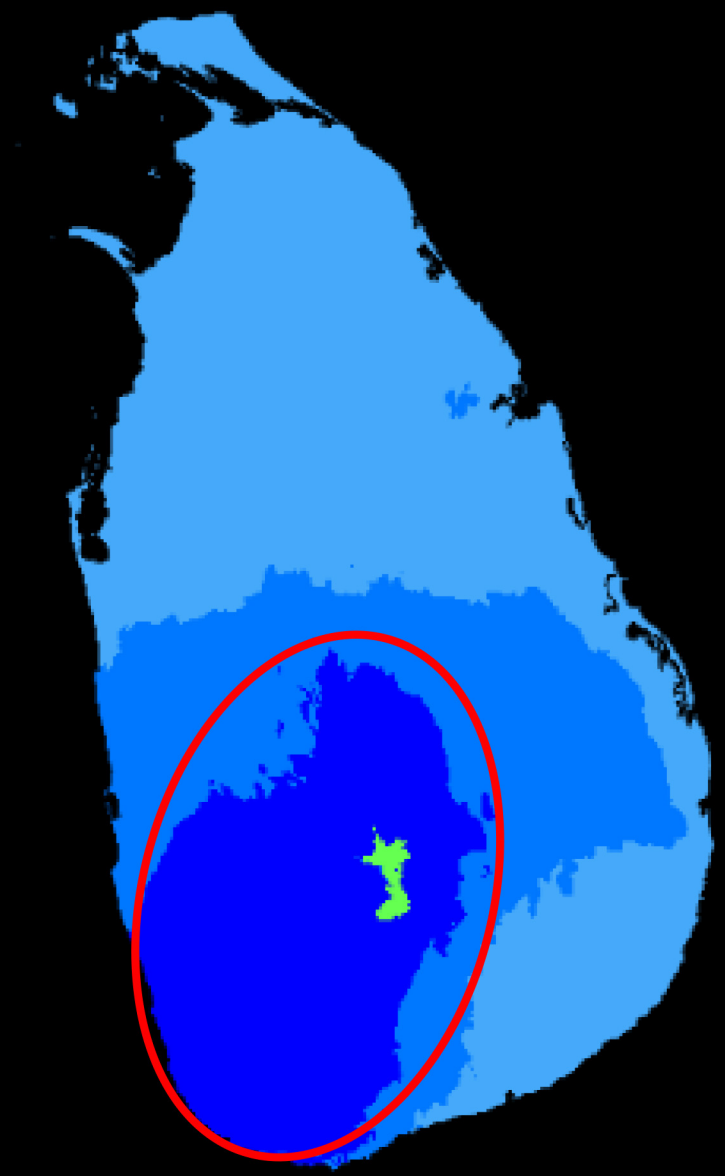
‘Worst-case’ Scenario
RCP 8.5 as at 2100

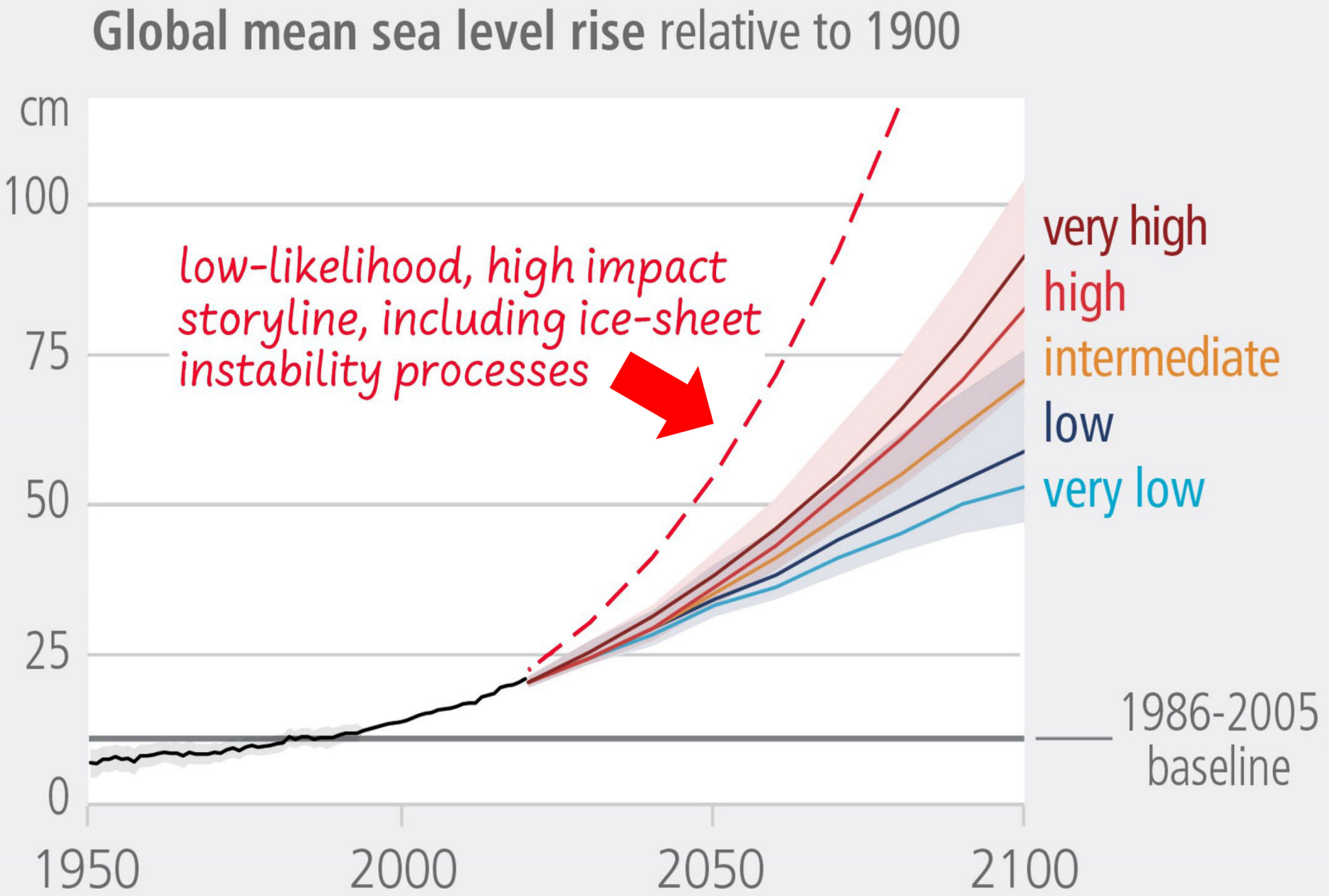


Beck, H.E., Zimmermann, N.E., McVicar, T.R., Vergopolan, N., Berg, A. and Wood, E.F., 2018. Present and future Köppen-Geiger climate classification maps at 1-km resolution. *Scientific Data*, *5*(1): 1-12.

PLAN

- Demographics
- Agriculture
- Water resources
- Conservation interventions





IPCC, 2023: Sections. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-9789291691647

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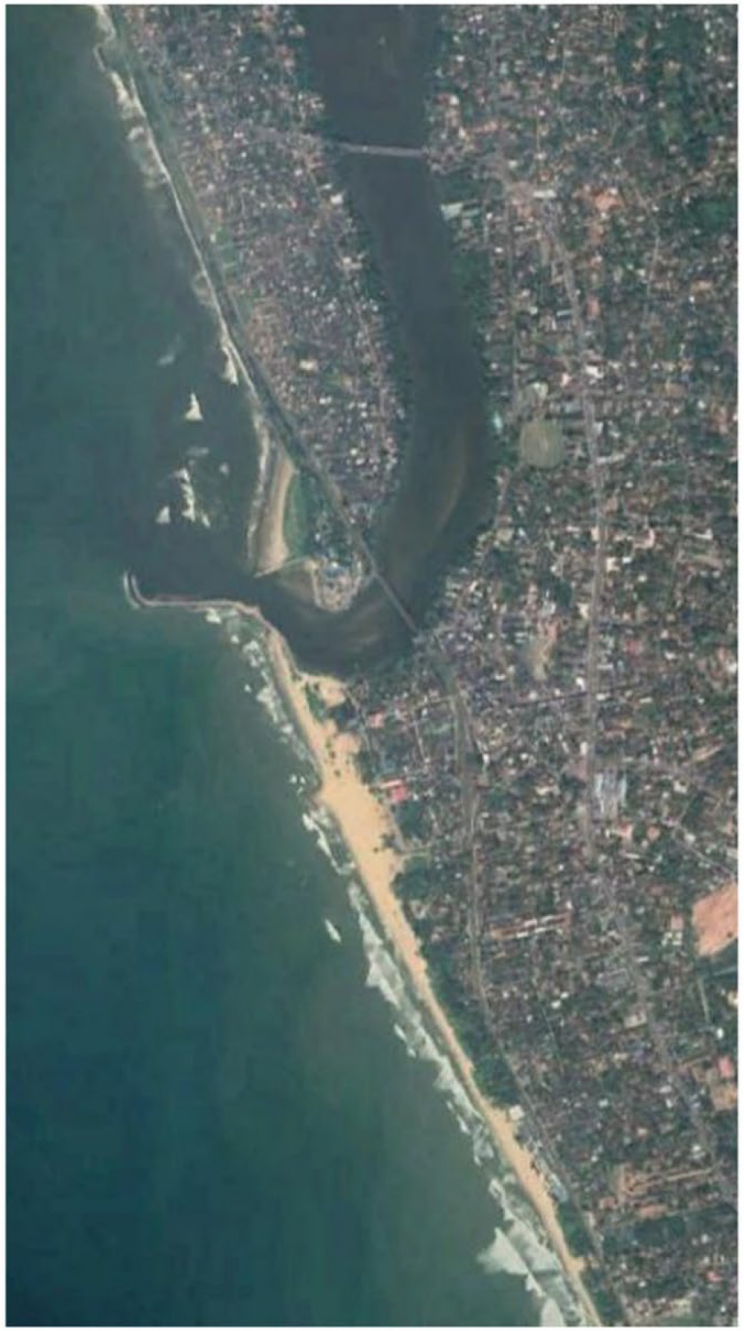
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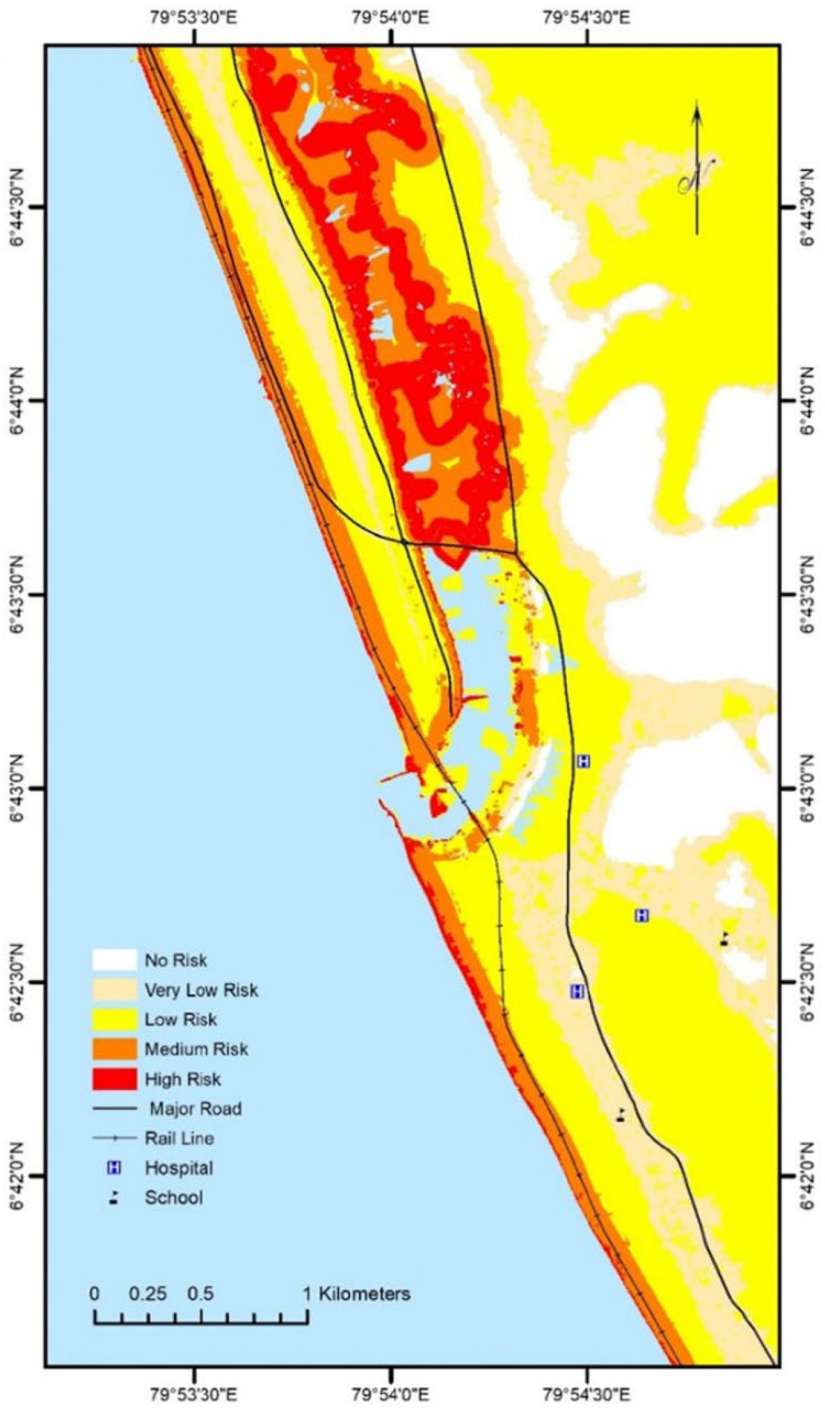
Salinity Extrusion Barrages





Panadura

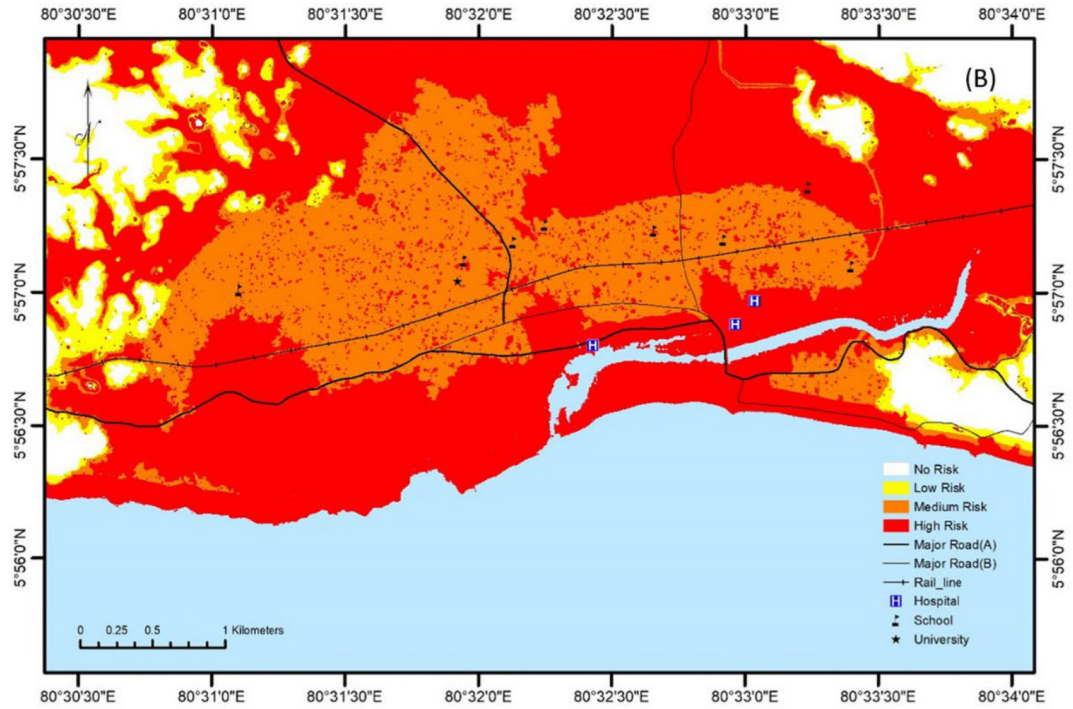




Palamakumbure, L., Ratnayake, A.S., Premasiri, H.R., Ratnayake, N.P., Katupotha, J., Dushyantha, N., Weththasinghe, S. and Weerakoon, W.P., 2020. Sea-level inundation and risk assessment along the south and southwest coasts of Sri Lanka. *Geoenvironmental Disasters*, 7: 1-9. DOI: 10.1186/s40677-020-00154-y

Matara





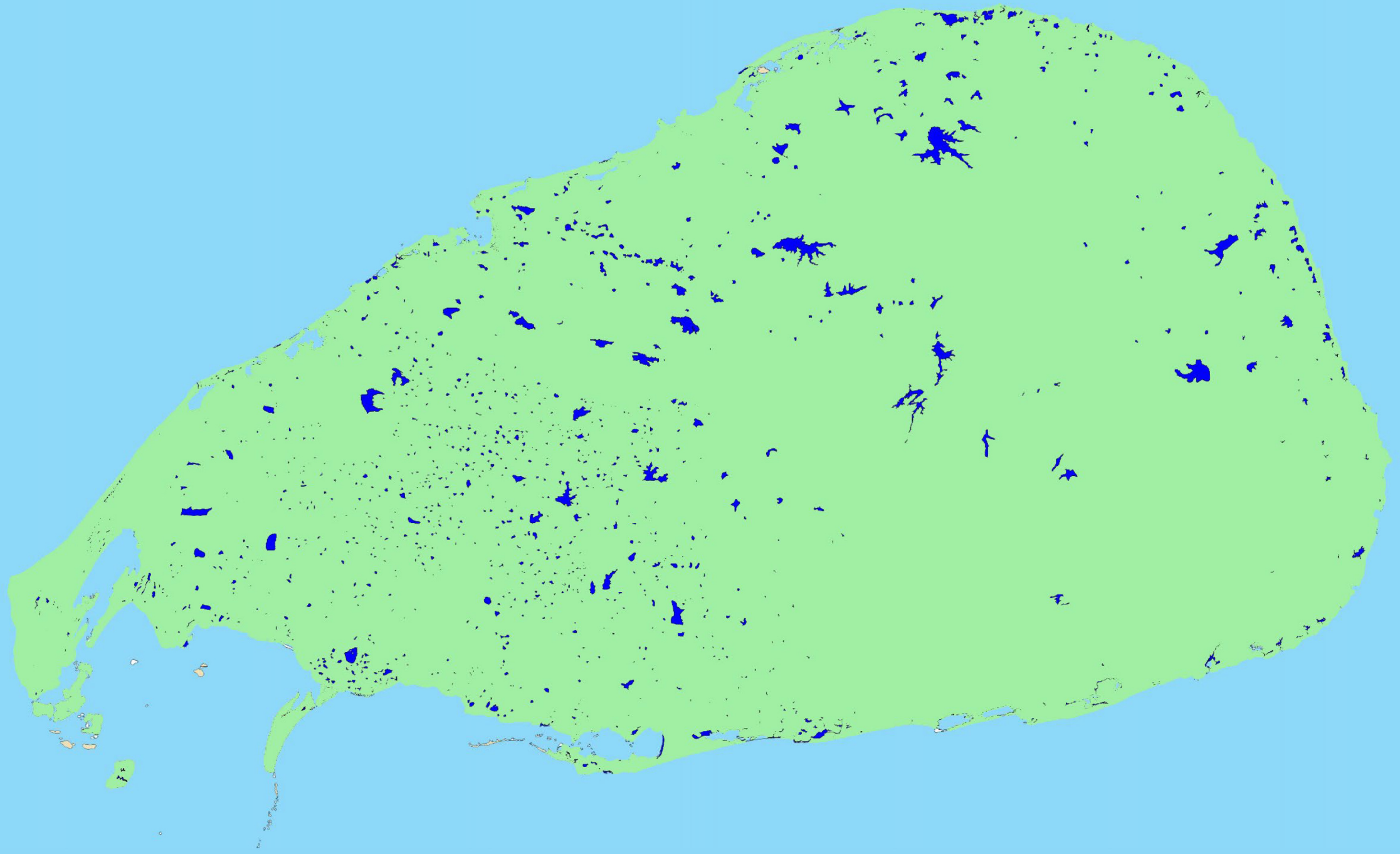
Palamakumbure, L., Ratnayake, A.S., Premasiri, H.R., Ratnayake, N.P., Katupotha, J., Dushyantha, N., Weththasinghe, S. and Weerakoon, W.P., 2020. Sea-level inundation and risk assessment along the south and southwest coasts of Sri Lanka. *Geoenvironmental Disasters*, 7: 1-9.
DOI: 10.1186/s40677-020-00154-y




Welcome
below sealevel
Schiphol
Welcome to Amsterdam Airport



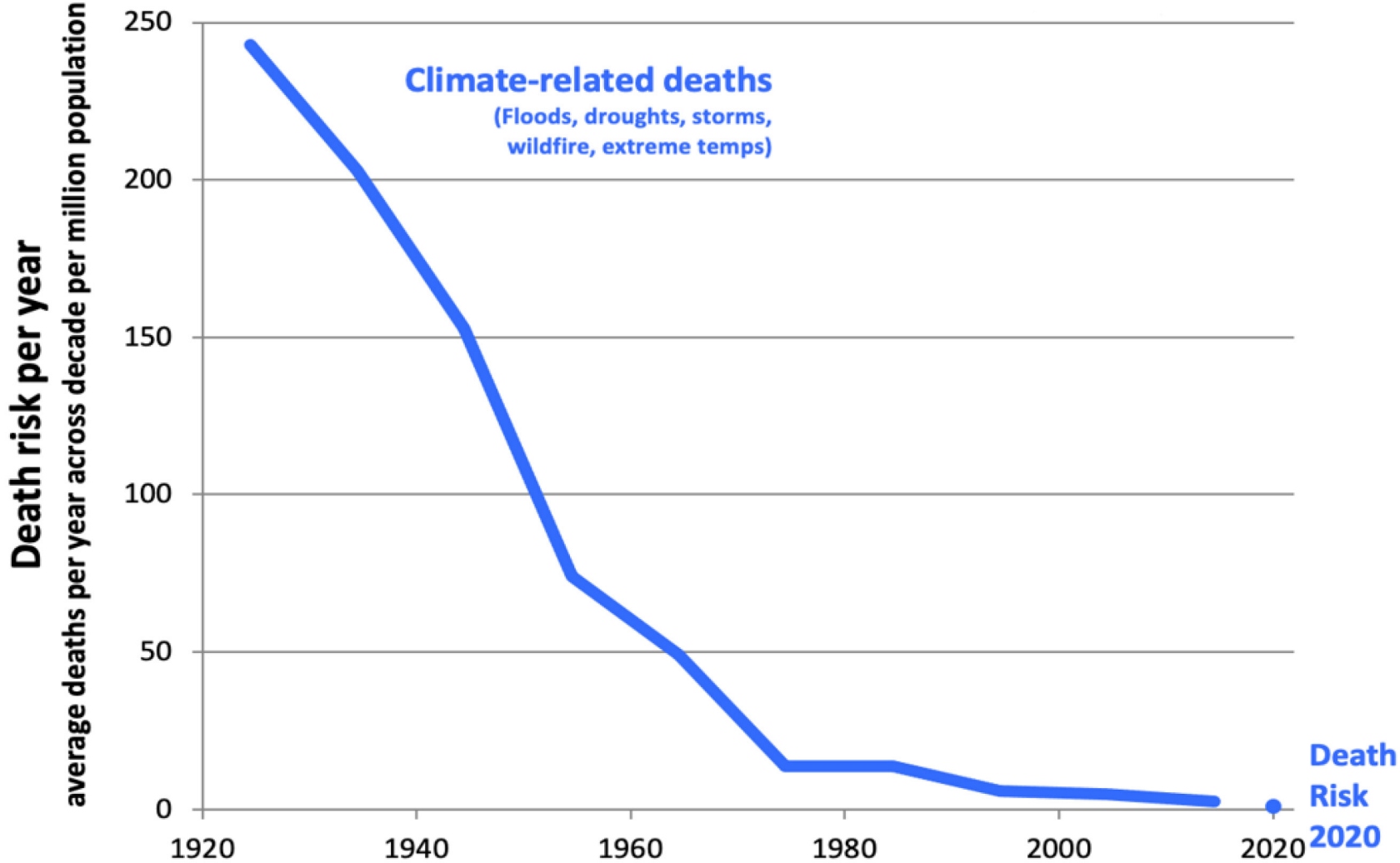

LMD



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Climate-related Death Risk 1920-2020



OFDA/CRED International Disaster Database, www.emdat.be, deaths averaged over decades 1920-29, 1930-1939, ... 2010-2019, with data from 2020, as start of next decade, accessed January 1, 2021

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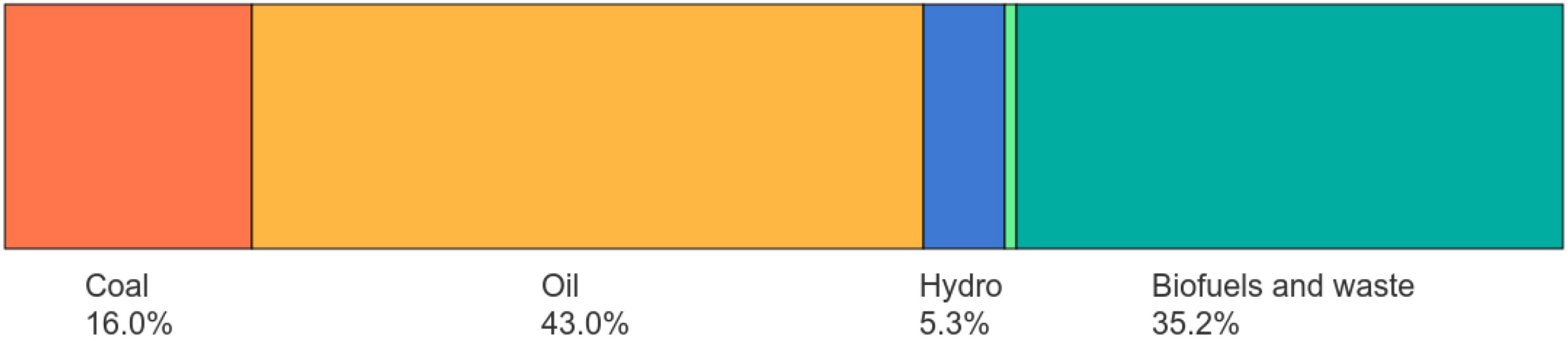
BECOMING A GOOD GLOBAL CITIZEN

'NET ZERO'

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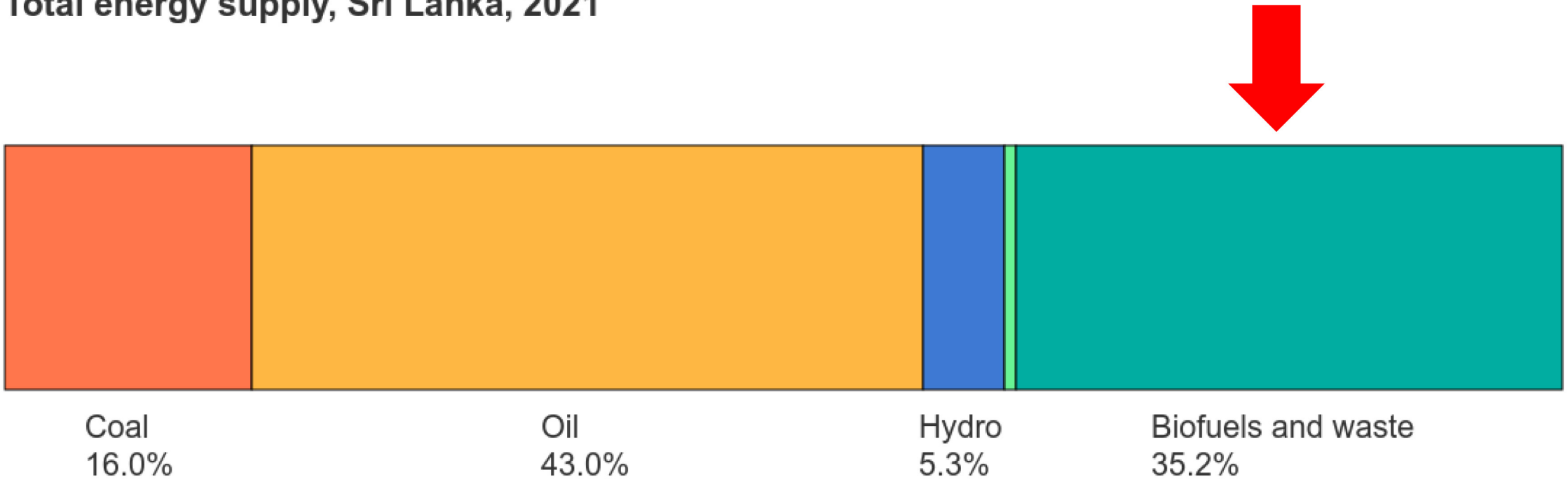
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Total energy supply, Sri Lanka, 2021



Source: International Energy Agency. Licence: CC BY 4.0

Total energy supply, Sri Lanka, 2021



Source: International Energy Agency. Licence: CC BY 4.0


AFP

TEA

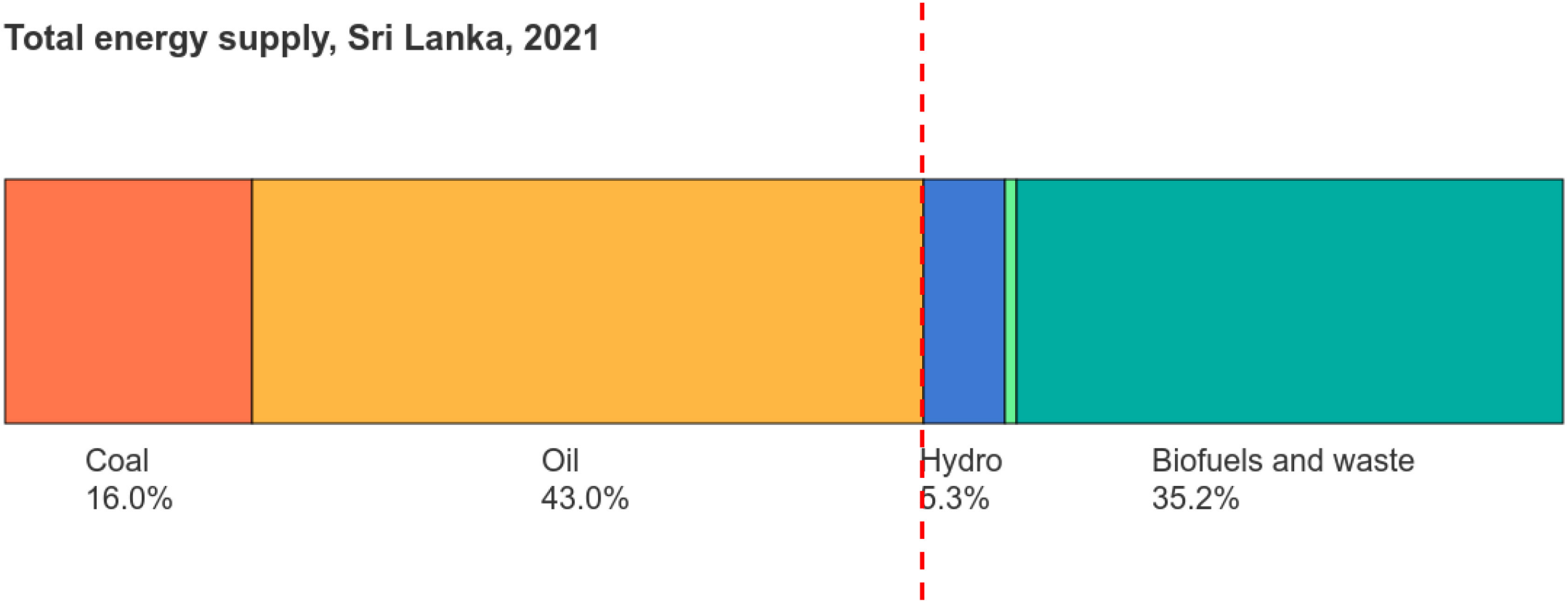
90% of Production Energy from Biomass



Sri Lanka Sustainable Energy Authority. https://www.energy.gov.lk/images/energy-management/energy-consumption-benchmark-analysis.pdf

Musafer, N. 2020. International Journal of Advances in Engineering and Management, 2(11): 336-347.

Total energy supply, Sri Lanka, 2021

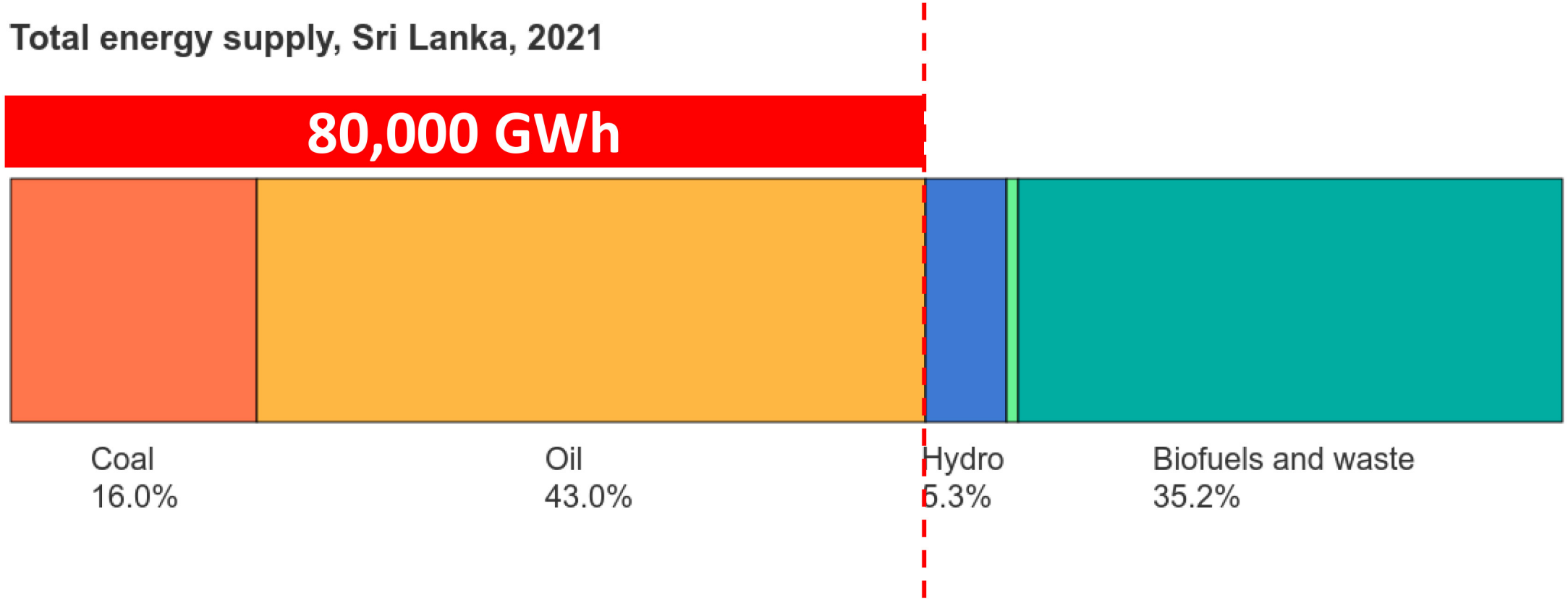


Source: International Energy Agency. Licence: CC BY 4.0

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Total energy supply, Sri Lanka, 2021



Source: International Energy Agency. Licence: CC BY 4.0

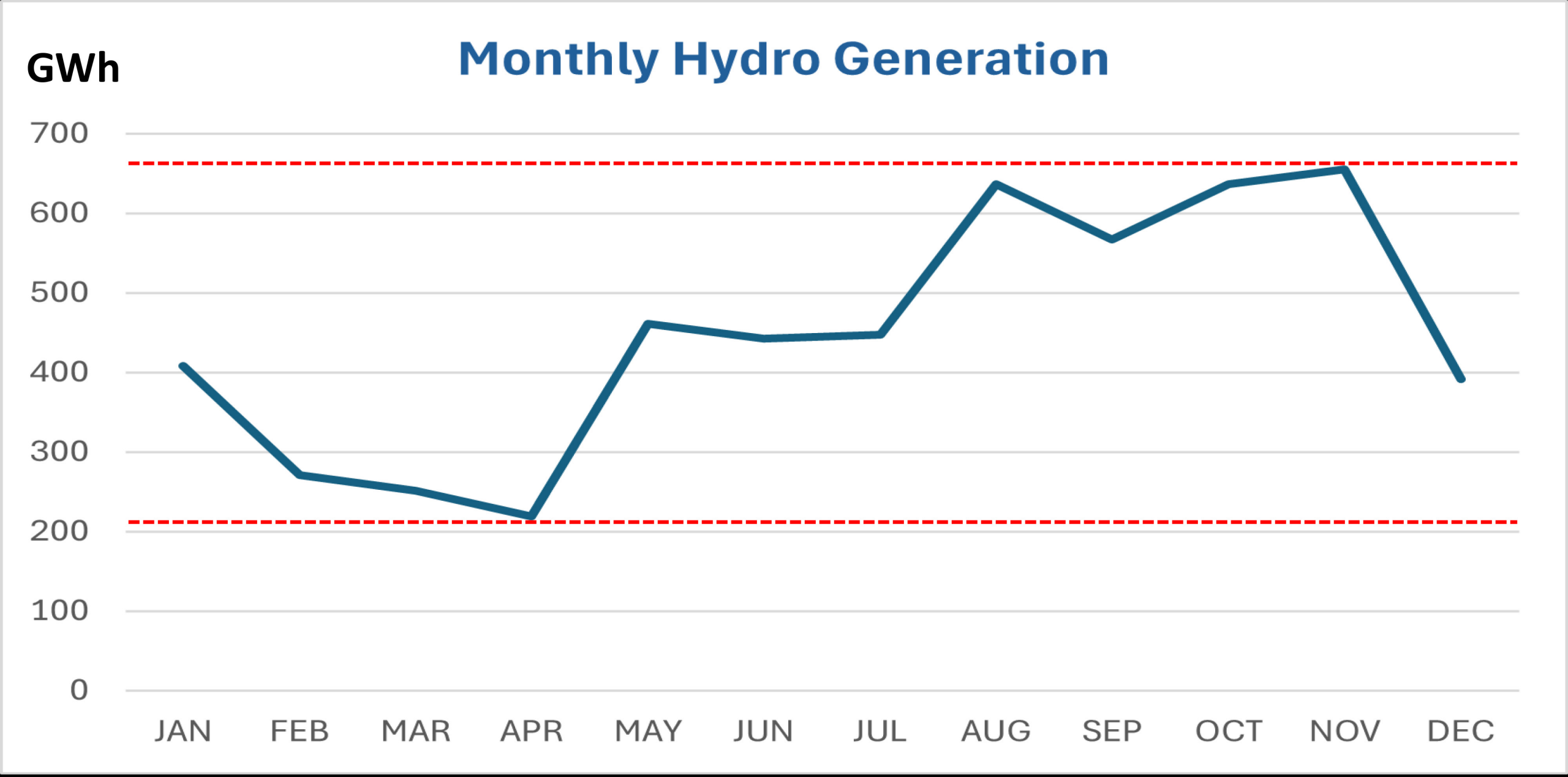
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We've maxed out hydro and biomass

Hence, based on a mix of ⅓ each of wind, solar and nuclear, the capital cost for generating 80,000 GWh / yr

~ US$ 40 bn



Ceylon Electricity Board, 2023. Sales and Generation Data Book, 2022. Statistical Unit, Corporate Strategy & Regulatory A airs Branch Ceylon Electricity Board, Colombo. 112 pp.

Monthly Wind Power Generation



Kalpage, K.M.T., Peiris, K.R.D., Perera, K.A.I.R.P., Siriwardana, M.G.C.I., Lidula, N.W.A. and Wickramarathna, M.T.A.P., 2015. Wind resource assesment and turbine selection: case study for Mannar, Sri Lanka. http://dl.lib.uom.lk/bitstream/handle/123/20387/TP2.pdf?sequence=1

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Convert National Vehicle Fleet to Electric

Vehicle type	No.	Unit $	Total Bn $
Motorcycles	4.6 mn	1,500	7
3-wheelers	1.2 mn	2,500	3
Cars + jeeps	1.3 mn	20,000	26
Trucks	0.4 mn	20,000	8
Buses	0.1 mn	30,000	3
			$ 47 Bn

CAPITAL COST OF NET ZERO

Low-carbon energy generation	$ 40 bn

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CAPITAL COST OF NET ZERO

Low-carbon energy generation	$ 40 bn
Converting vehicle fleet to electric	$ 47 bn

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CAPITAL COST OF NET ZERO

Low-carbon energy generation	$ 40 bn
Converting vehicle fleet to electric	$ 47 bn
Provision for B&C	$ 13 bn

TRANSPARENCY INTERNATIONAL
the global coalition against corruption

SRI LANKA

Score

34/100

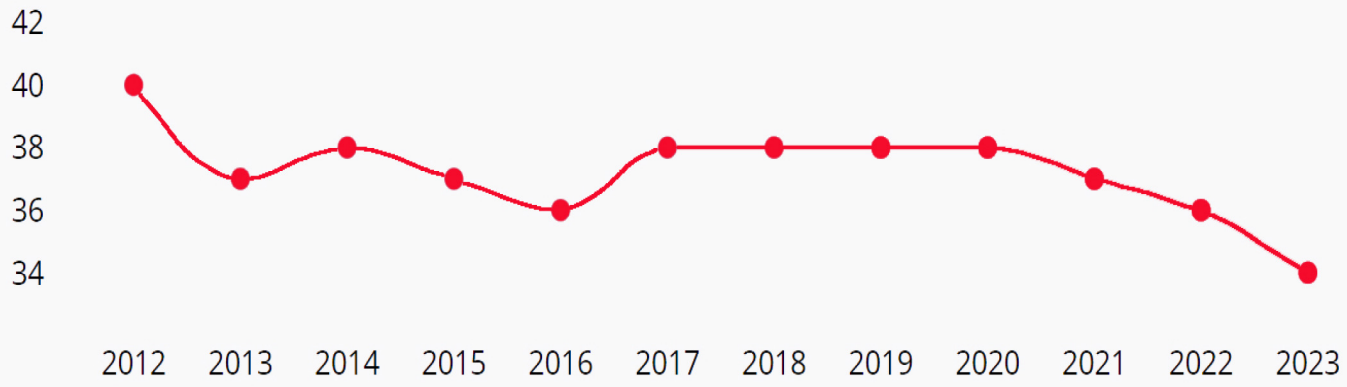
Rank

115/180

Score change

-2 Since 2022

Score changes 2012 - 2023



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CAPITAL COST OF NET ZERO

Low-carbon energy generation	$ 40 bn
Converting vehicle fleet to electric	$ 47 bn
Provision for B&C	$ 13 bn

Total capital investment for Net Zero ~ $ 100 bn

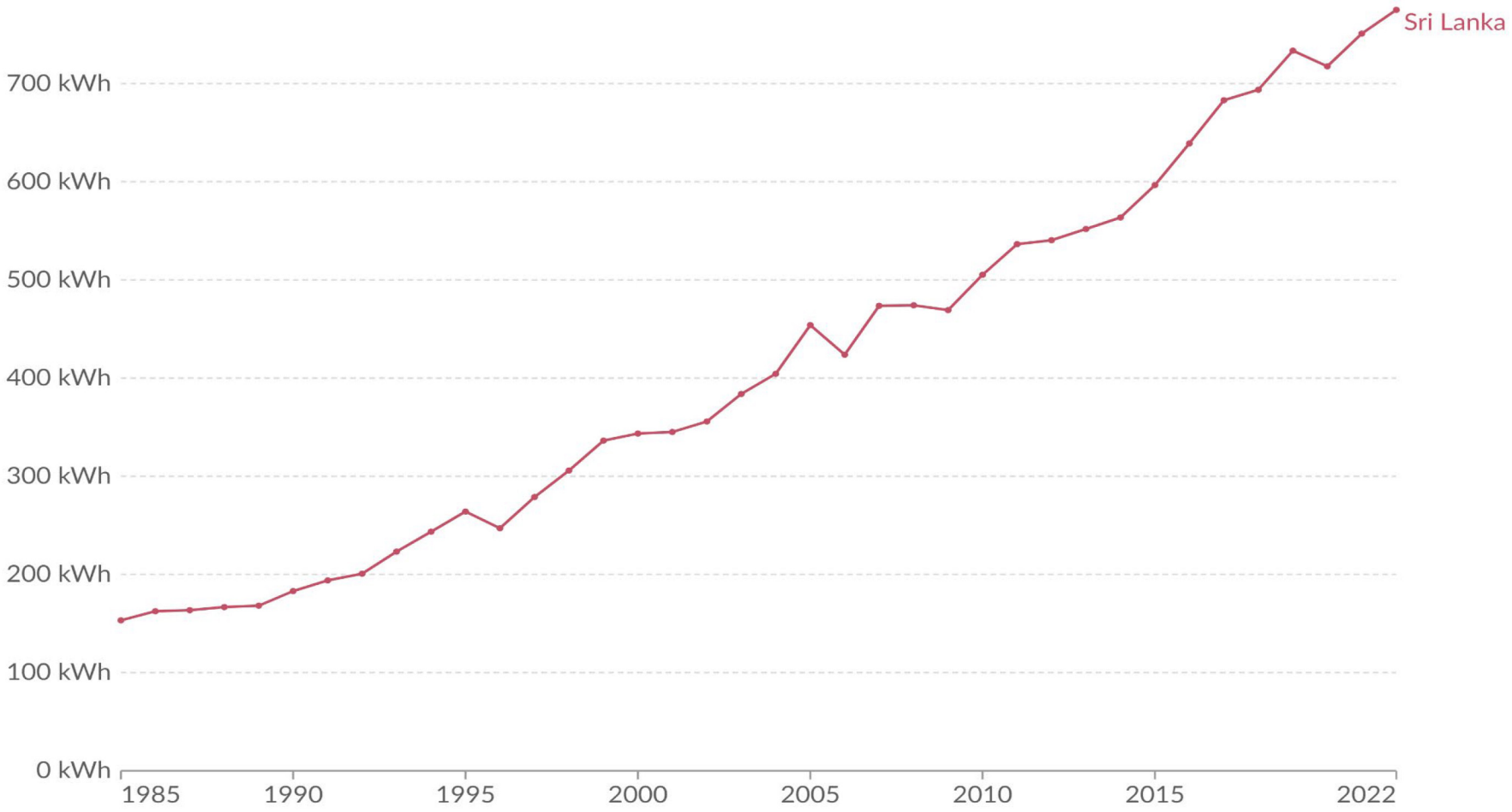
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Per capita electricity generation

Annual average electricity generation per person, measured in kilowatt-hours[1].

Our World in Data



Data source: Ember - Yearly Electricity Data (2023) and other sources

OurWorldInData.org/energy | CC BY

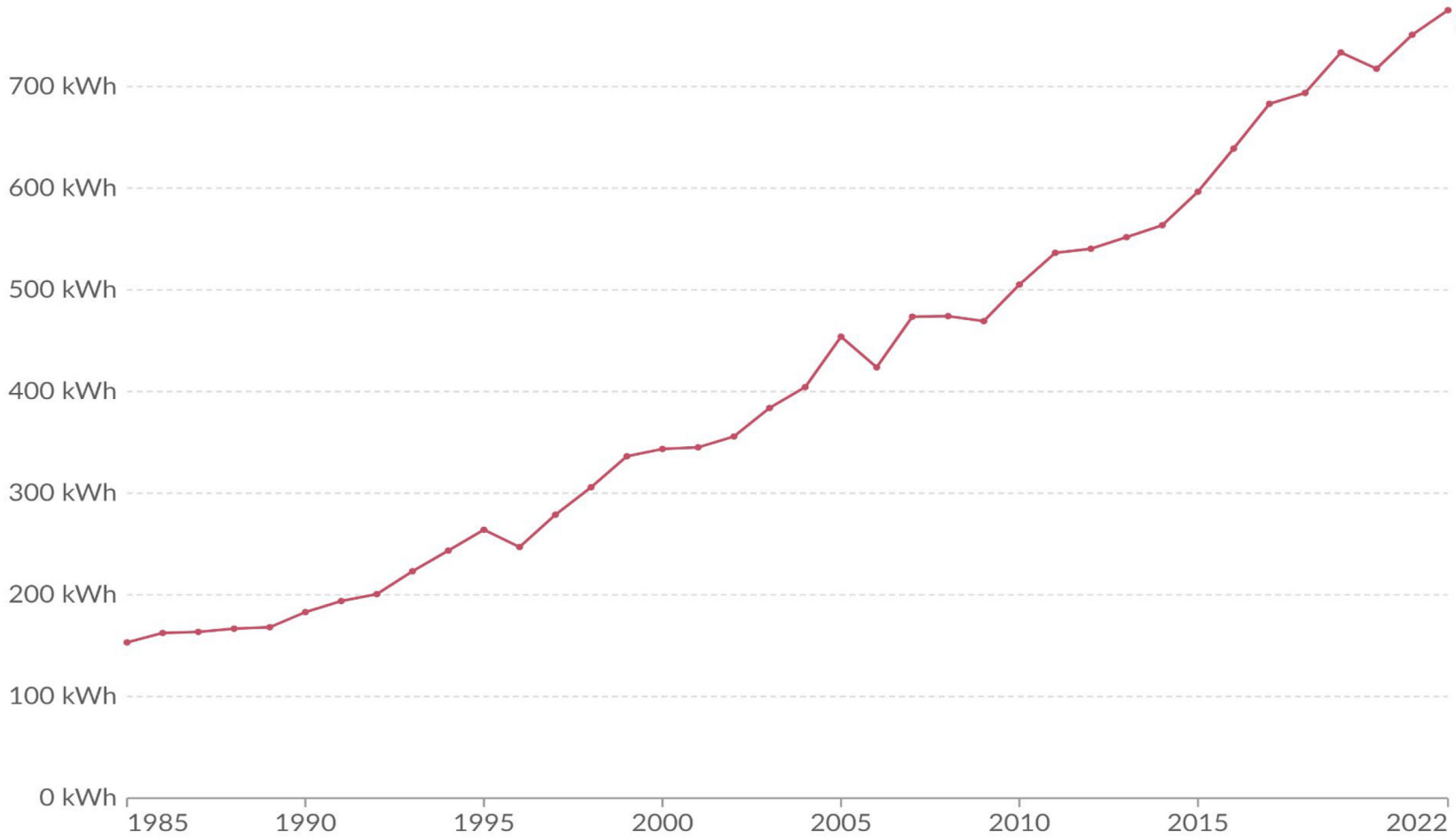
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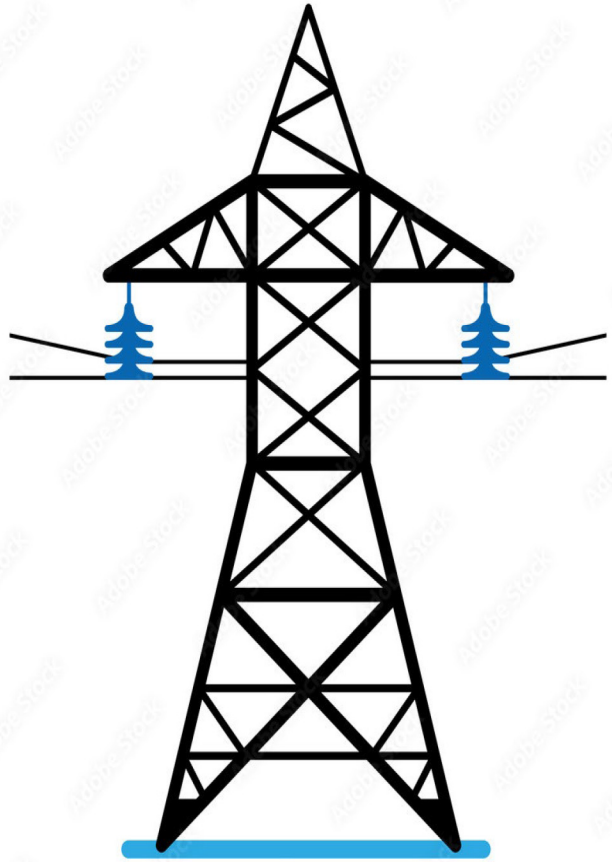
The Ceylon Chamber of Commerce

Per capita electricity generation

Annual average electricity generation per person, measured in kilowatt-hours[1].

Our World in Data





Data source: Ember - Yearly Electricity Data (2023) and other sources

OurWorldInData.org/energy | CC BY


Bloomberg


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ALIMENTAIR

World leaders on track to miss climate change targets and it could cost billions, warns Schroders

The investment giant argues that global temperatures are set to rise by more than 4 degrees above pre-Industrial Revolution levels, way above what was agreed in 2015 by world leaders in Paris

Josie Cox Business Editor • Monday 17 July 2017 15:17 BST • Comments



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Scotland to ditch key climate change target

17 April

Climate



Scotland was aiming to cut emissions by 75% by the end of the decade

By Kevin Keane
BBC Scotland's environment correspondent

The Scottish government is to ditch its flagship target of reducing greenhouse gas emissions by 75% by 2030.

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The Guardian

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Green politics

Rishi Sunak announces U-turn on key green targets

UK prime minister delays ban on sale of new petrol and diesel cars as he pushes back net zero goals

UK politics live – latest updates

Pippa Crerar, Fiona Harvey *and* Kiran Stacey

Wed 20 Sep 2023 20.37 BST

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Rishi Sunak rolls back net zero targets in reset of UK climate policies – video

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