CODE RED SRI LANKA CLIMATE SUMMIT '24

The Ceylon Chamber of Commerce

The Local Impacts of Climate Change –

Implications for the Nation, Communities and Ecology

Rohan Pethiyagoda

CODE RED
SRI LANKA
CLIMATE
SUMMIT '24

The Ceylon Chamber of Commerce

- Changing rainfall
- Rising temperature

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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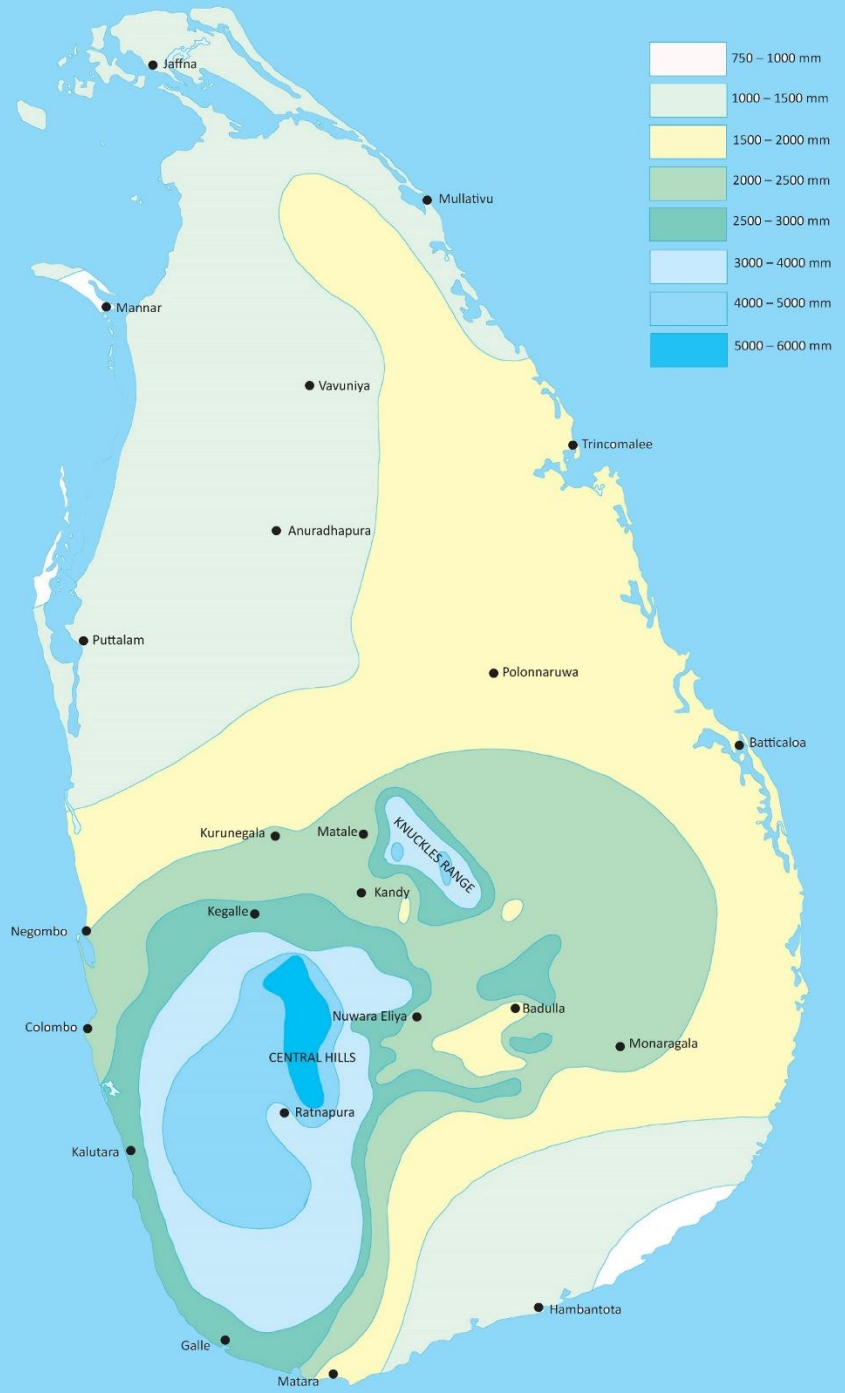
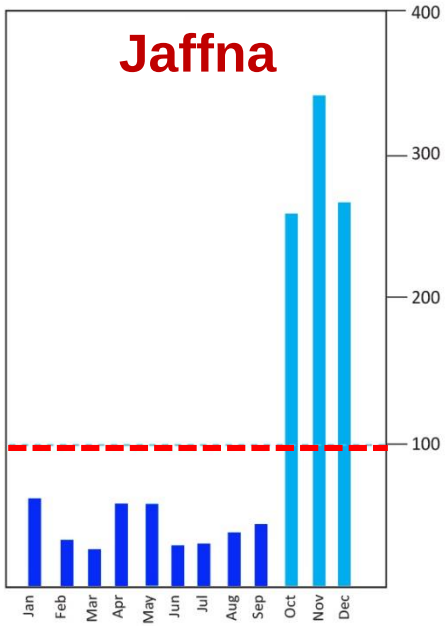
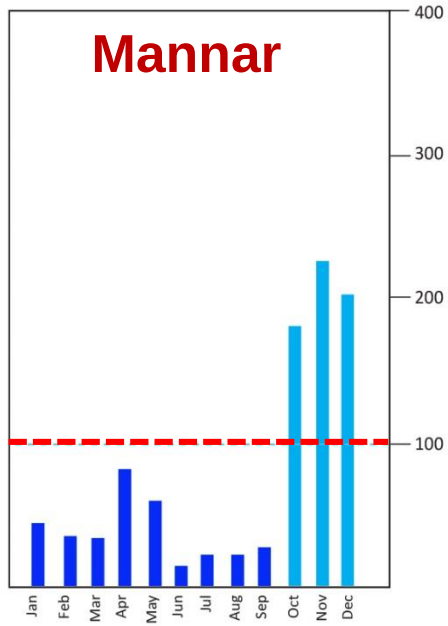
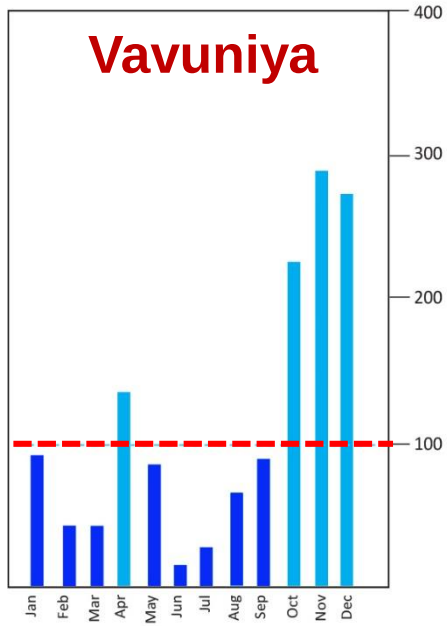
Changing Rainfall

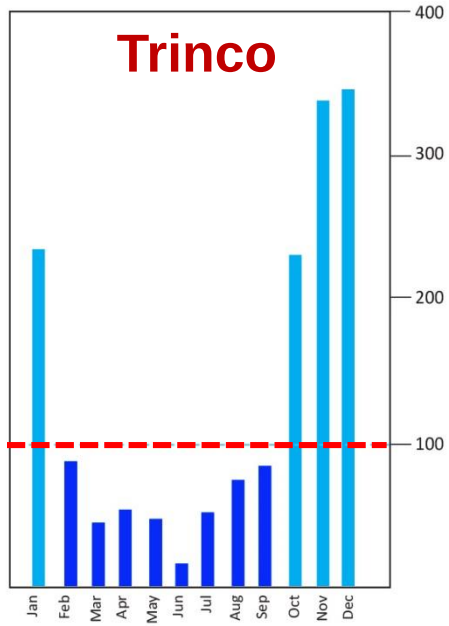
Consequences for Biodiversity & Agriculture

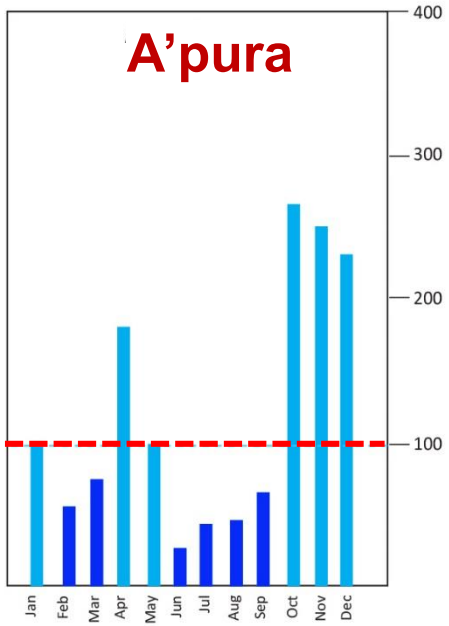

750 – 1000 mm
1000 – 1500 mm
1500 – 2000 mm
2000 – 2500 mm
2500 – 3000 mm
3000 – 4000 mm
4000 – 5000 mm
5000 – 6000 mm
Jaffna
Mullativu
Mannar
Vavuniya
Trincomalee
Anuradhapura
Puttalam
Polonnaruwa
Batticaloa
Kurunegala
Matale
KNUCKLES RANGE
Kandy
Kegalle
Negombo
Badulla
Nuwara Eliya
Colombo
Monaragala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



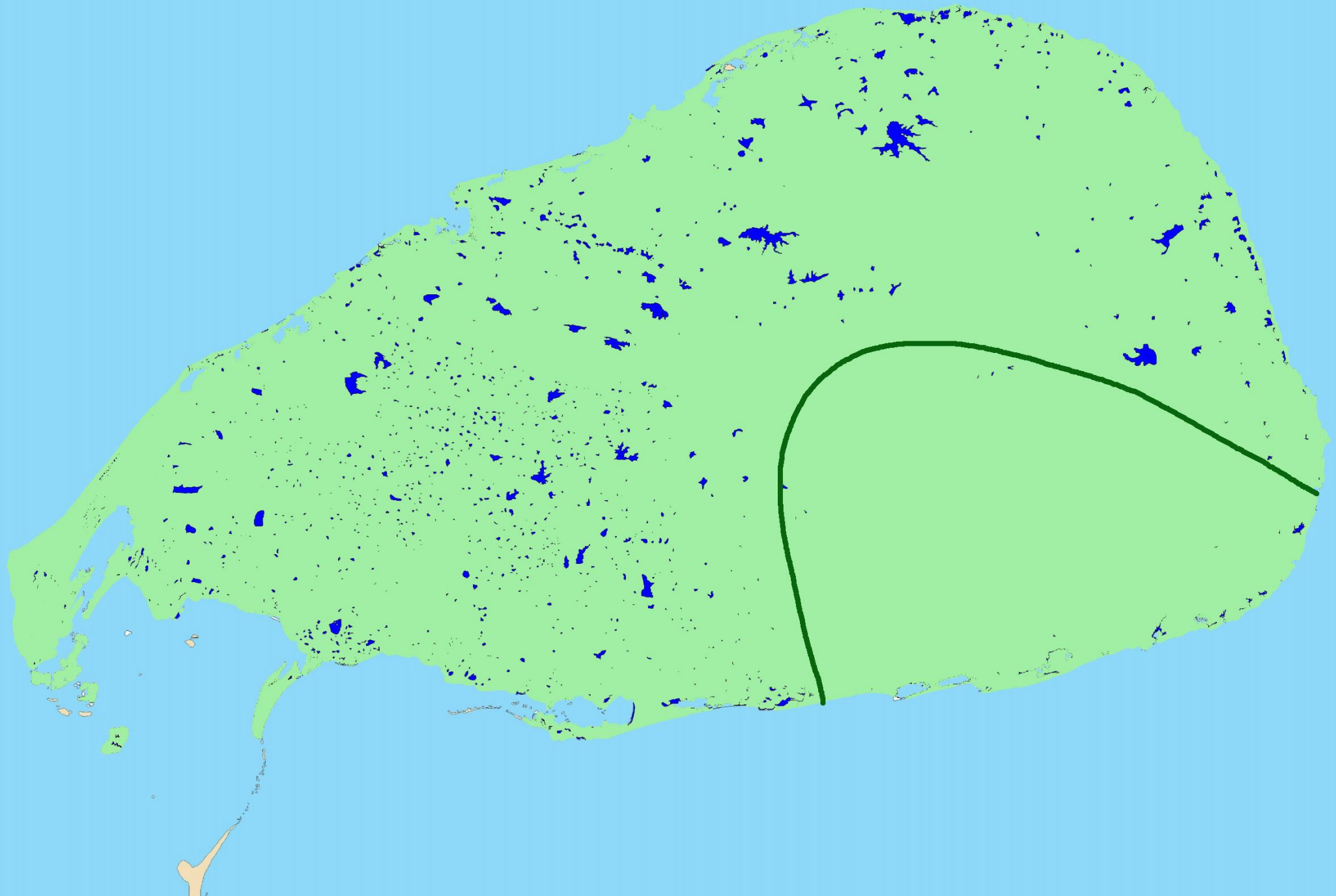


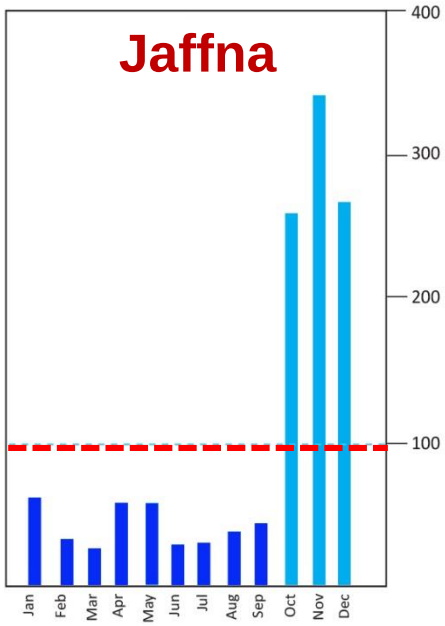


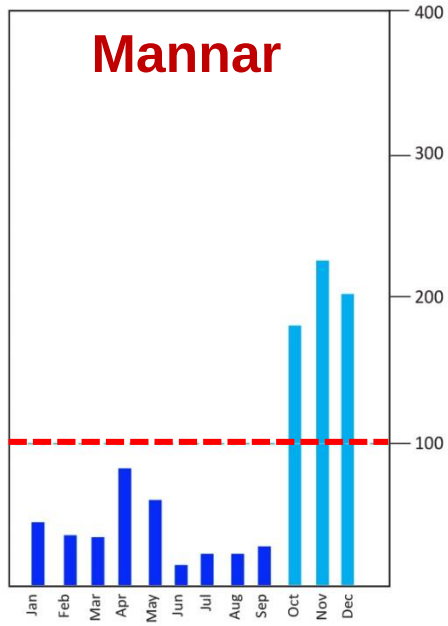


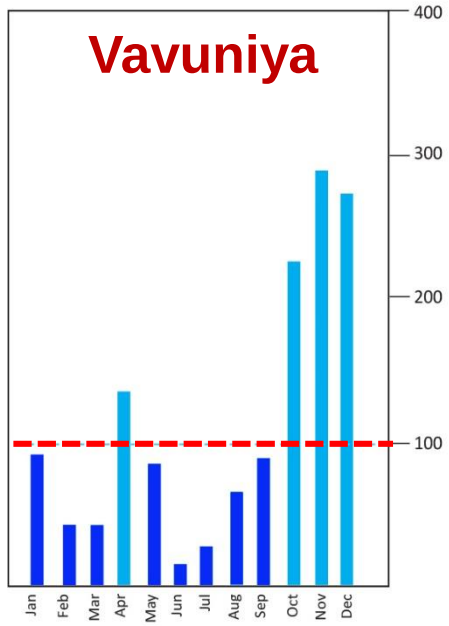


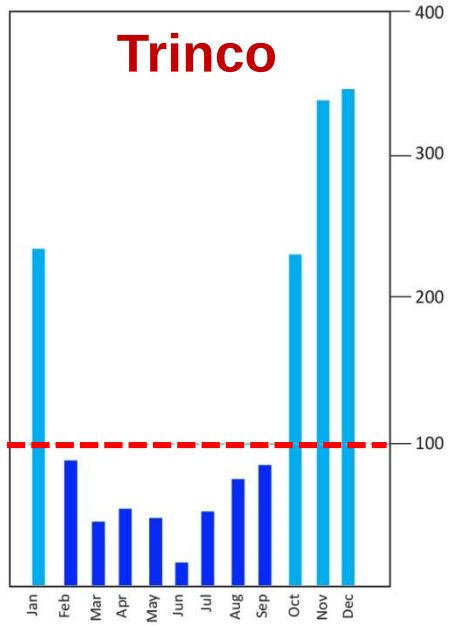
Mean monthly rainfall (mm)

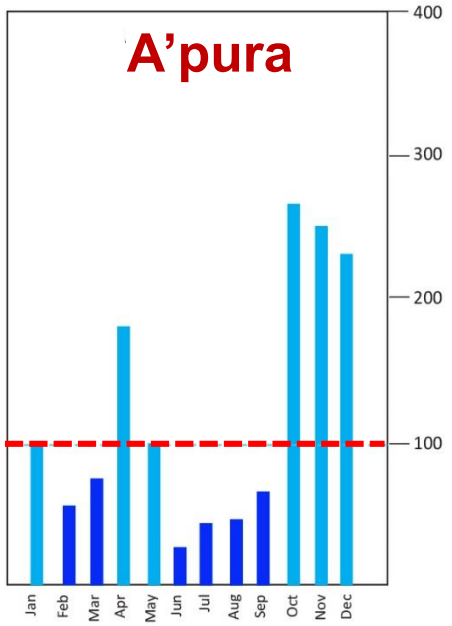




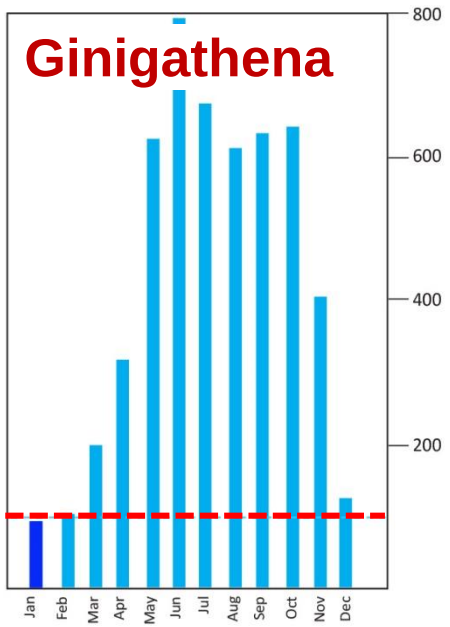


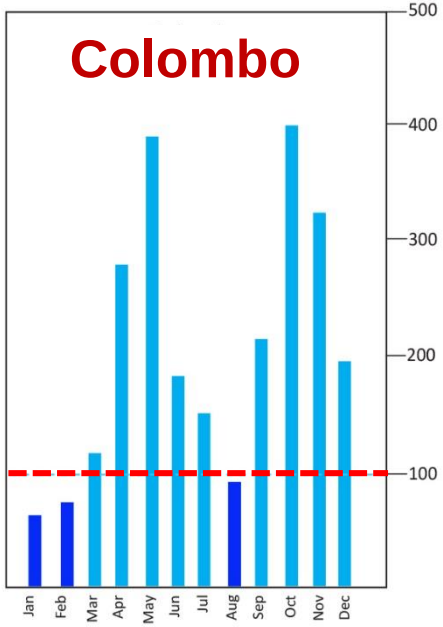


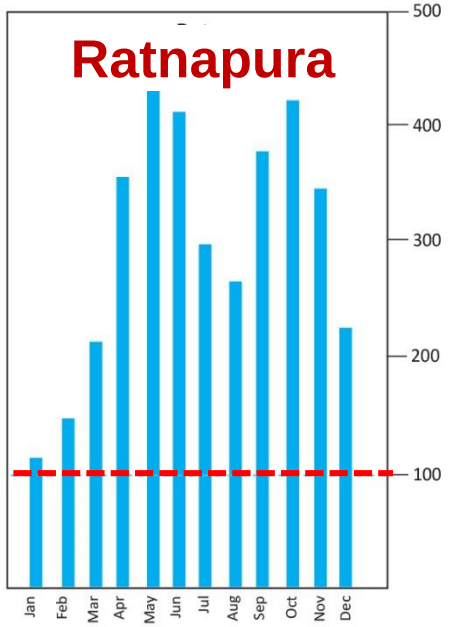


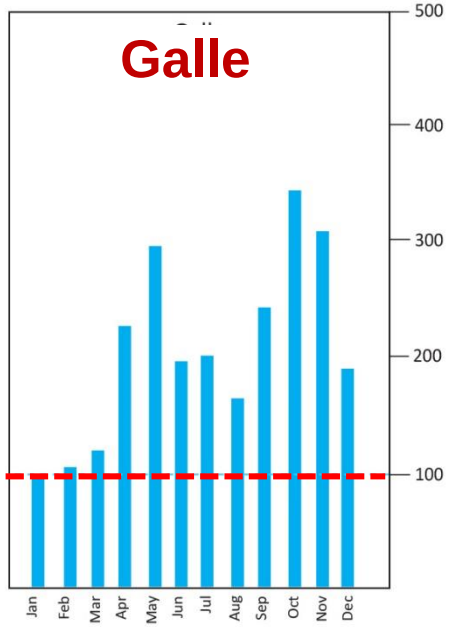


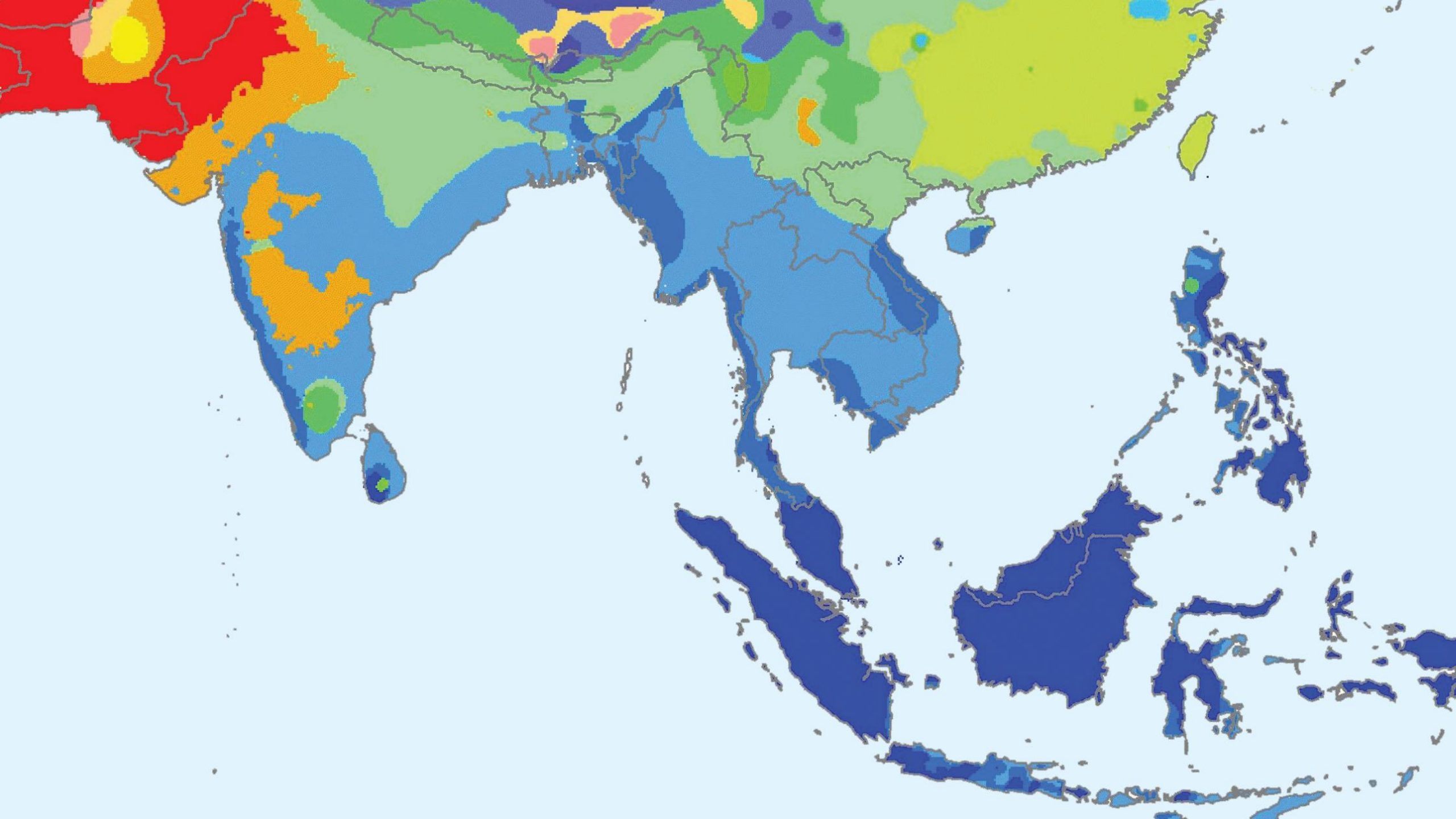
Mean monthly rainfall (mm)





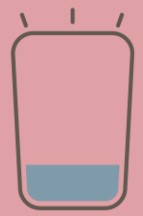
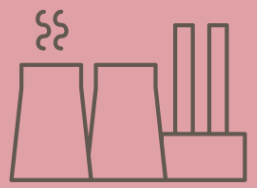
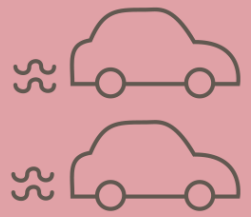
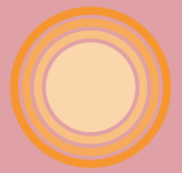






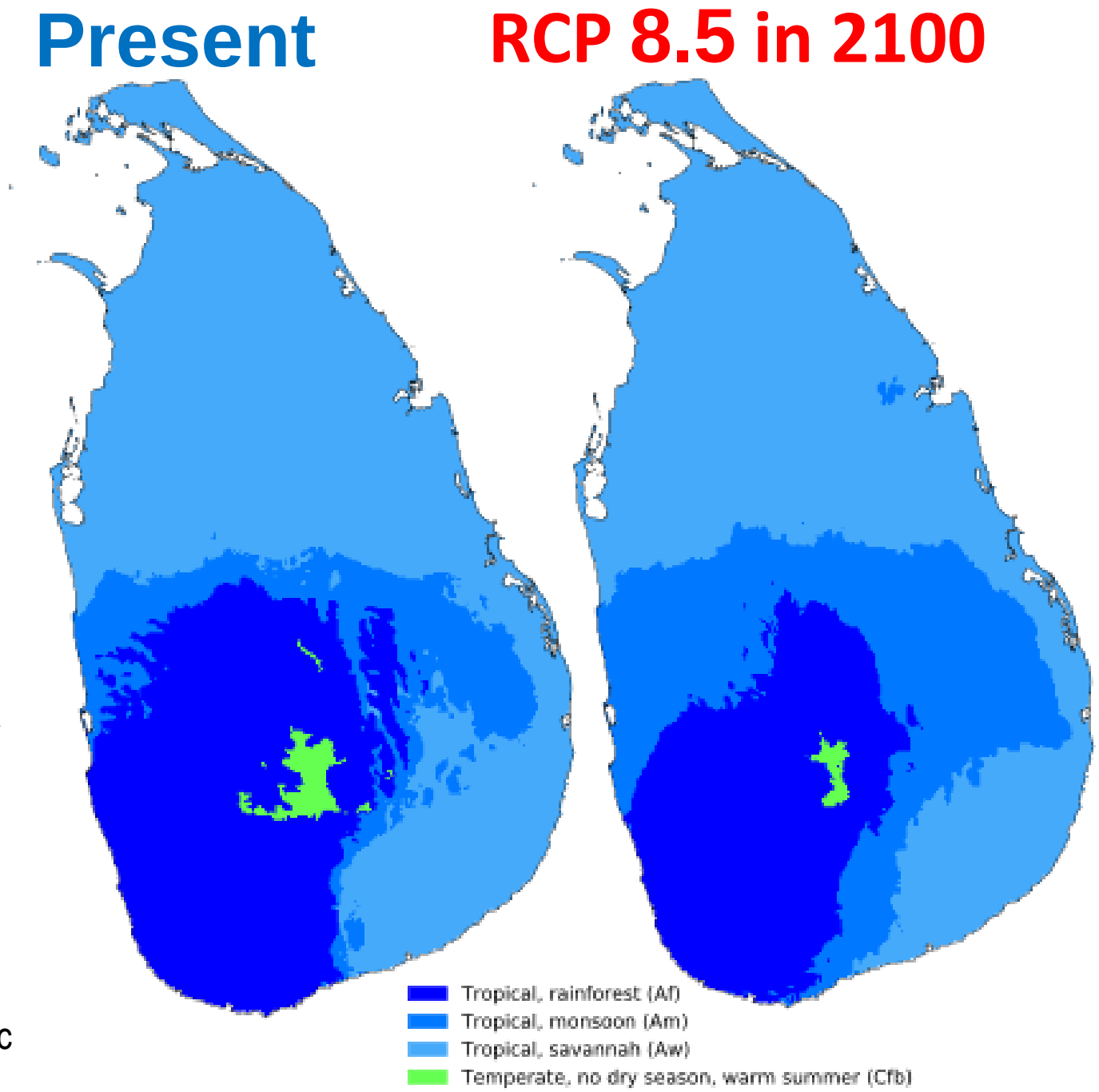
Hiranya Sudasinghe

Representative Concentration Pathway

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

Tea

The optimal area for tea will decline by about 10% by 2070



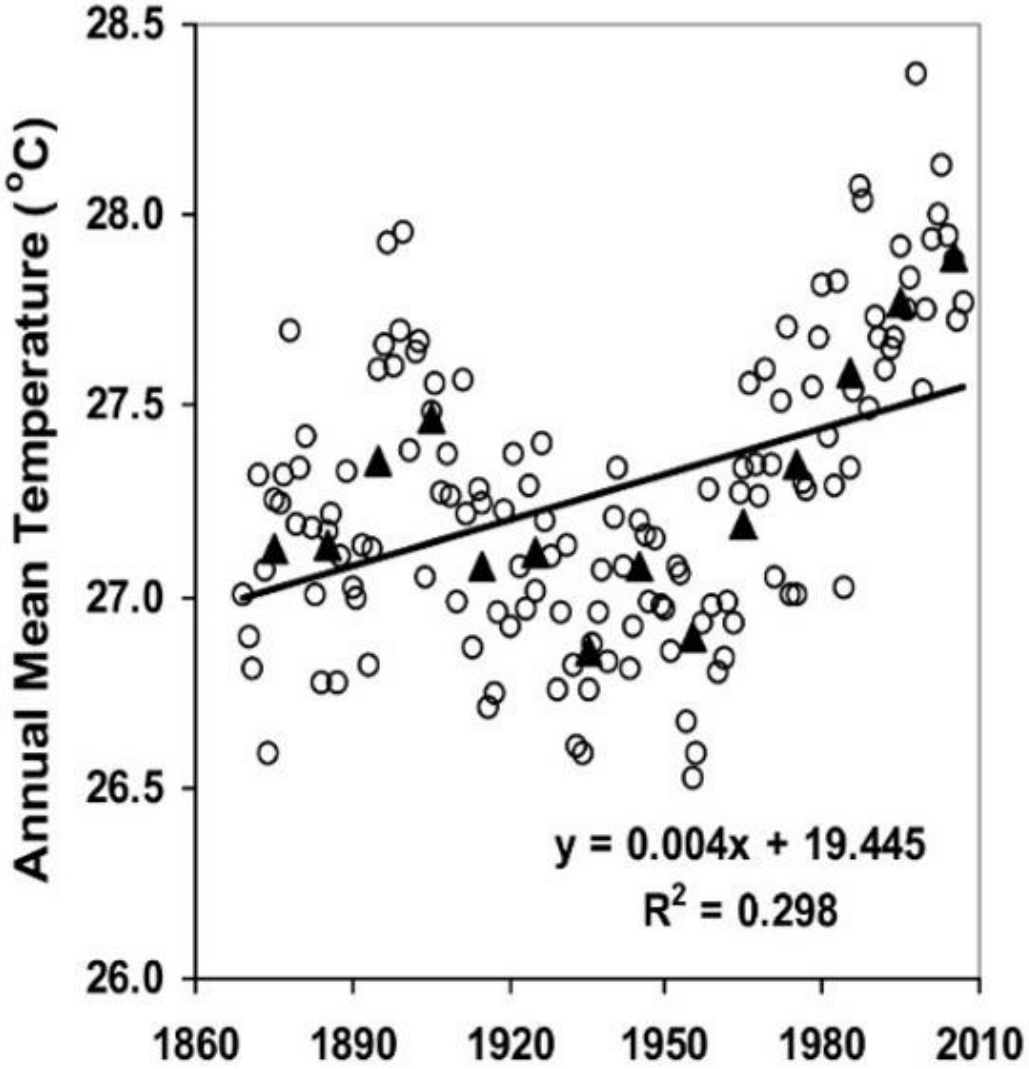
Jayasinghe, S.L. and Kumar, L., 2019. Modeling the climate suitability of tea [Camellia sinensis (L.) O. Kuntze] in Sri Lanka in response to current and future climate change scenarios. Agricultural and Forest Meteorology, 272: 102-117. DOI: 10.1016/j.agrformet.2019.03.025

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.

Climate Change Simulation Experiments

Rising Temperature

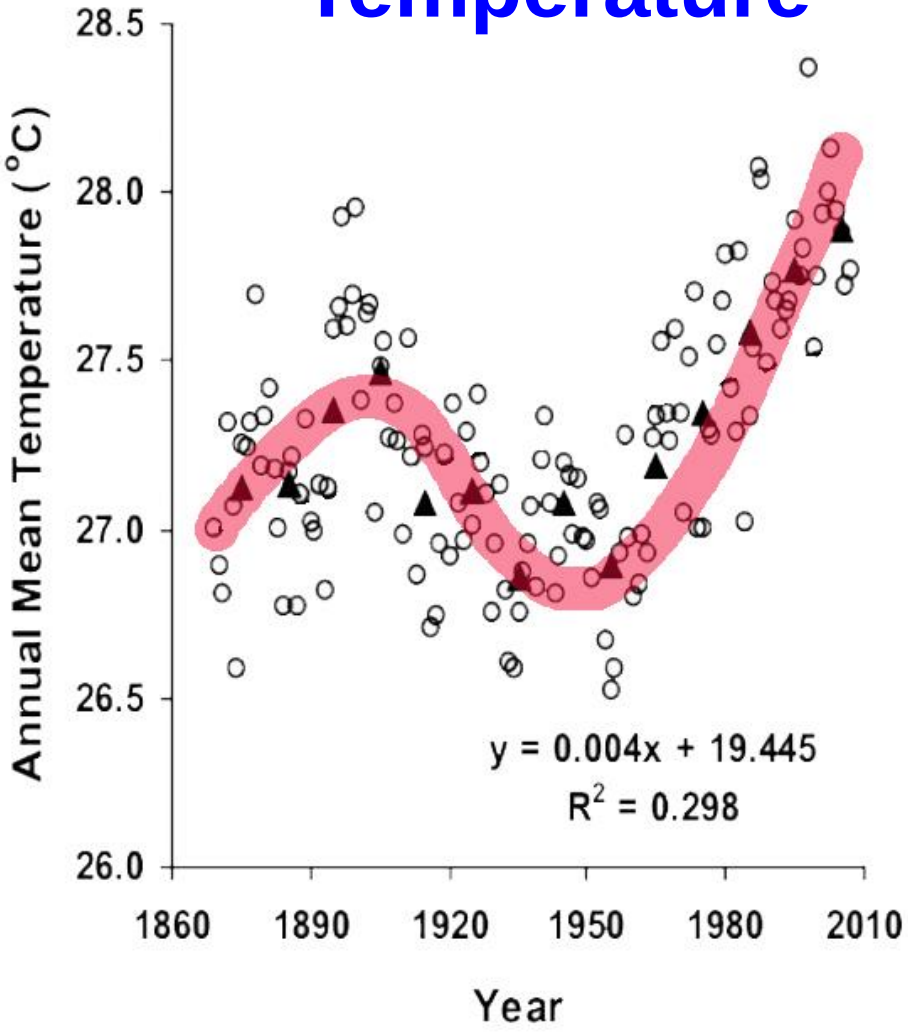
Temperature



Colombo

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.

Temperature



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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

Climate

The 30-year average weather conditions for a particular location.

UN World Meteorological Organization
https://wmo.int/topics/climate#:~:text=Climate%20is%20the%20average%20weather,above%20the%201850%2D1900%20average.

The Hottest Day in Colombo Ever?

The Hottest Day in Colombo Ever?

36.6°C

The Hottest Day in Colombo Ever?

36.6°C

2 January 1889

Department of Meteorology, 2007. Ever Recorded Daily Extreme Values.
https://web.archive.org/web/20091229081618/http://www.meteo.gov.lk/Up_Date/weather/Extreme%20Values.pdf

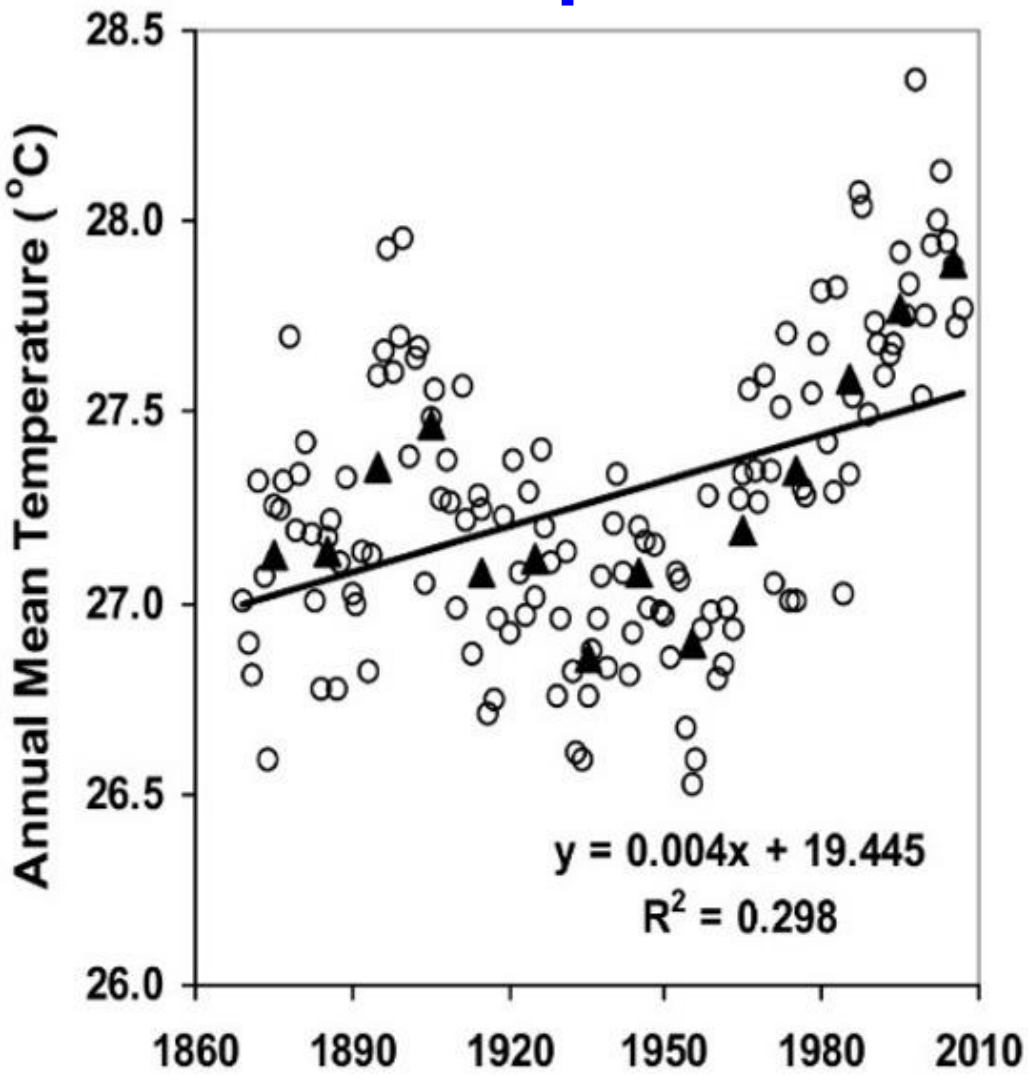
ANNUAL SUMMARY REPORT OF
CORAL REEF CONDITION 2021/2022

Continued coral recovery leads to 36-year highs across two-thirds of the Great Barrier Reef

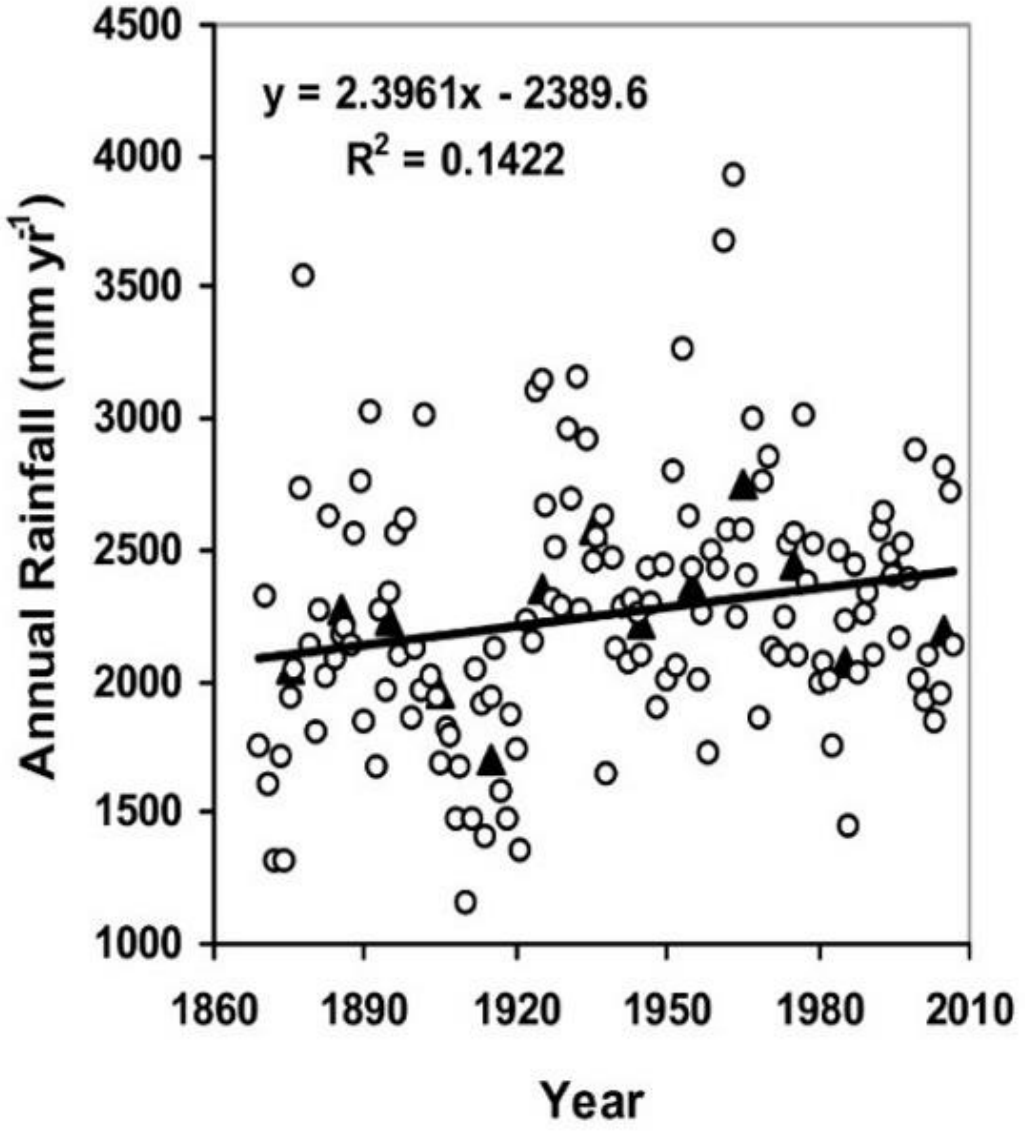
Australian Government

Australian Institute of Marine Science

Temperature

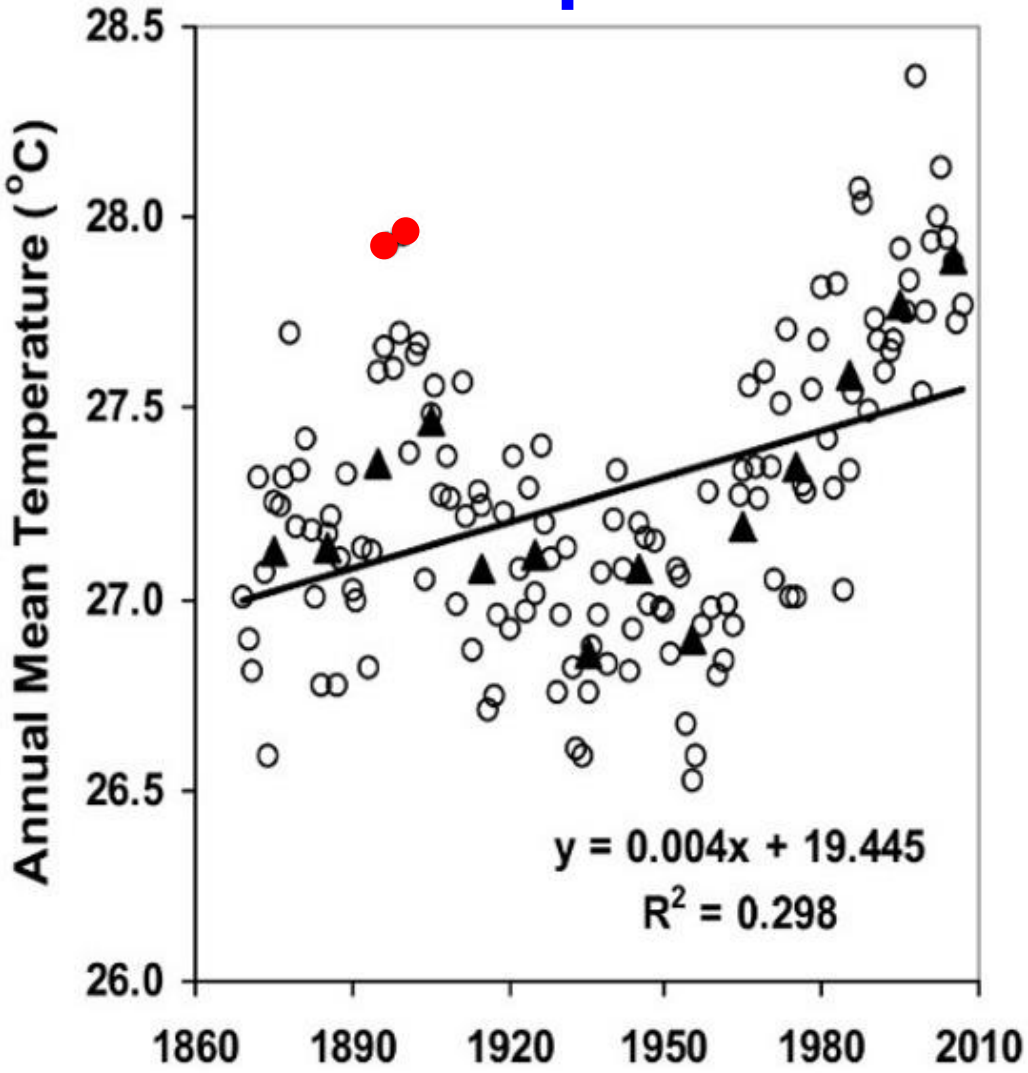


Rainfall

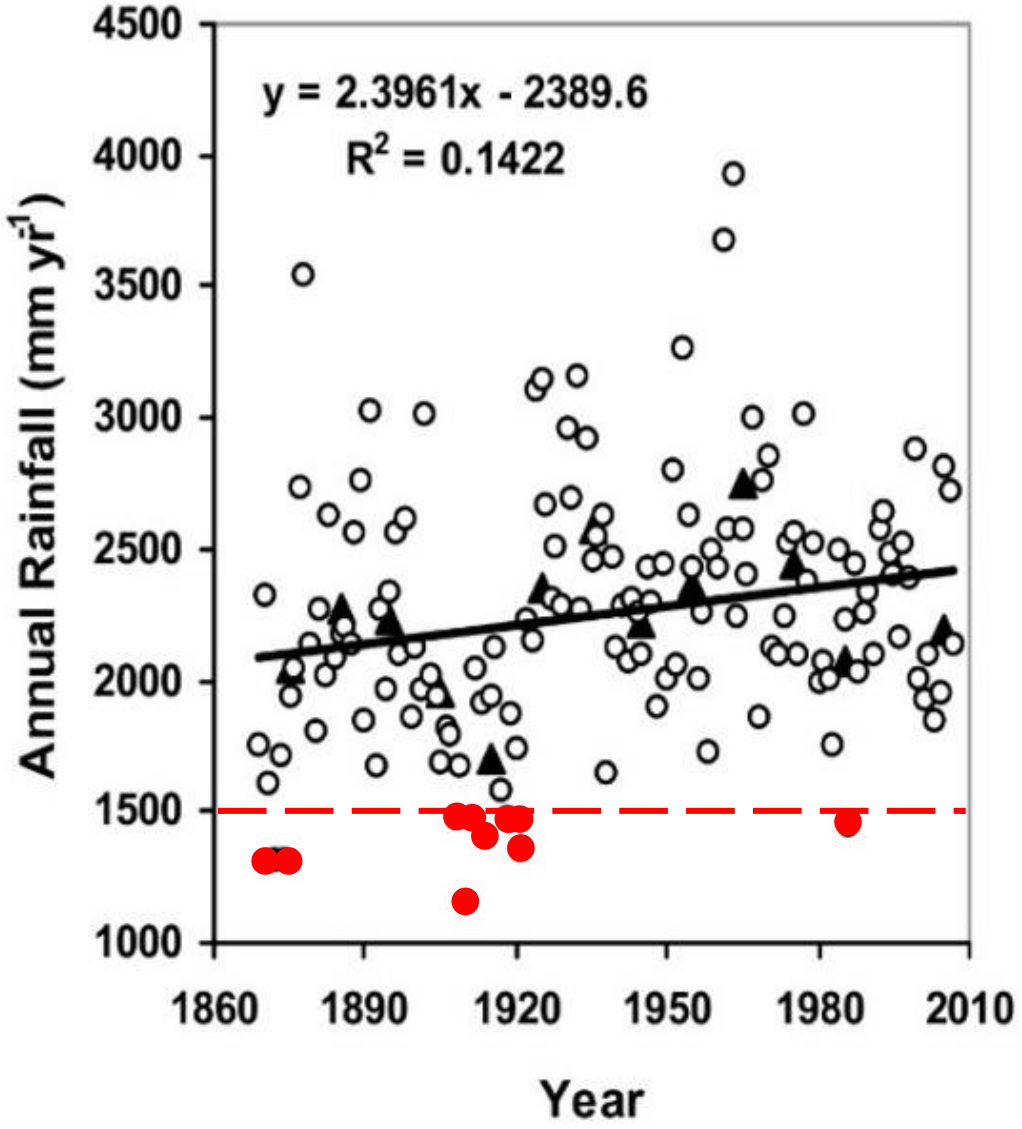


Colombo

Temperature

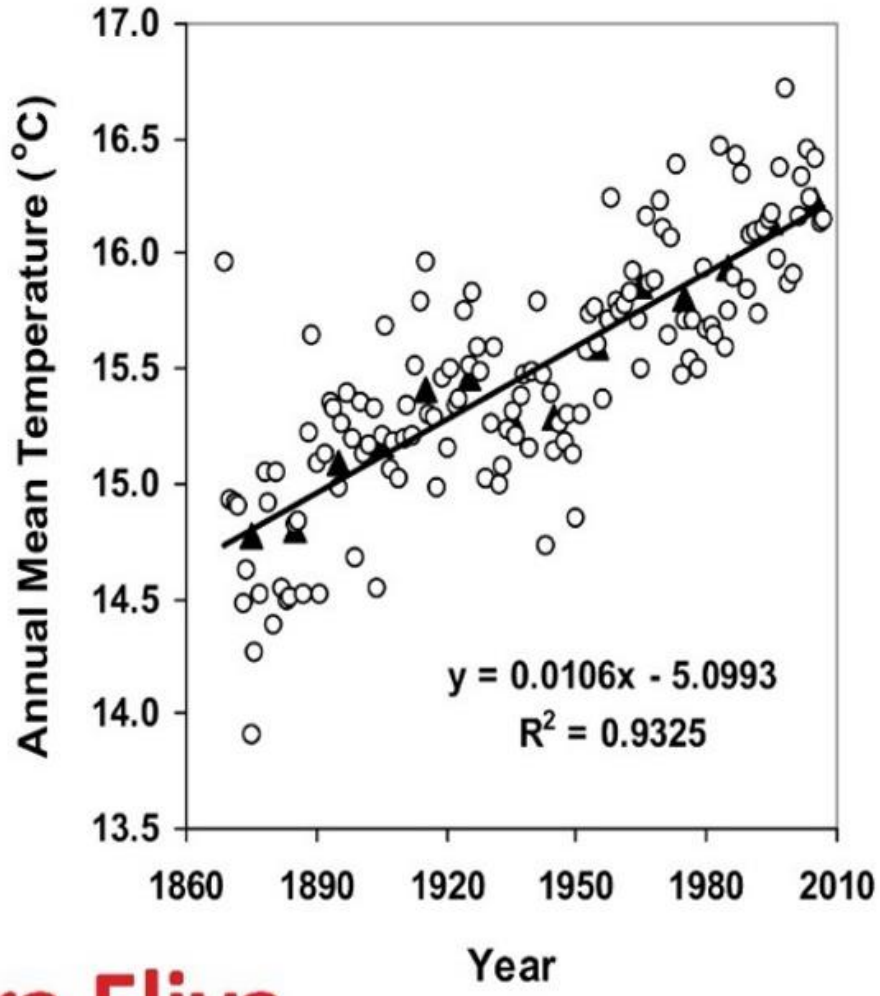


Rainfall



Colombo

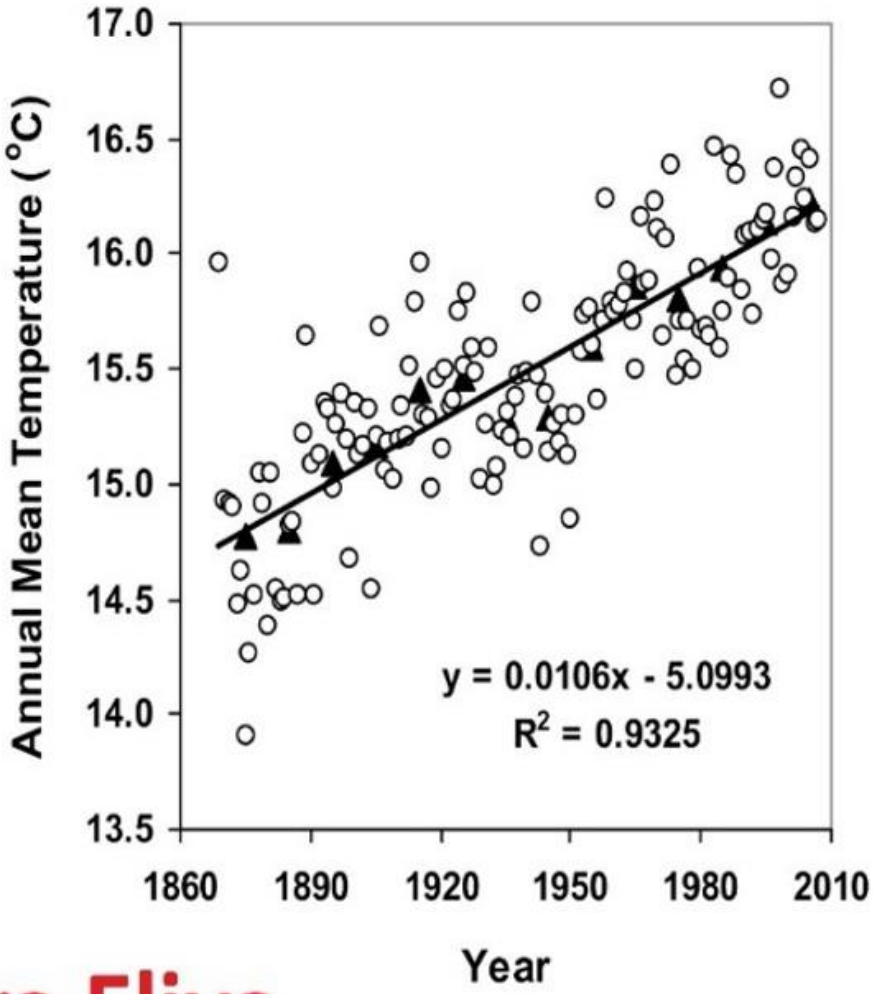
Temperature



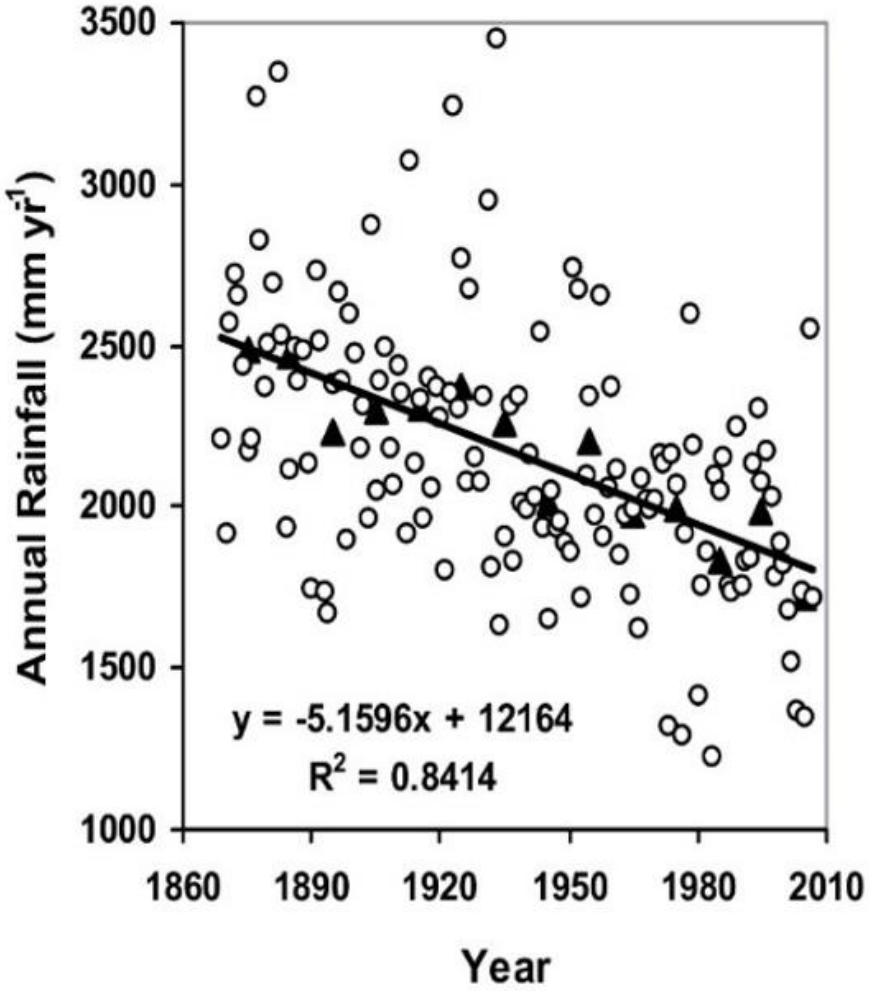
Nuwara Eliya

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

Temperature



Rainfall



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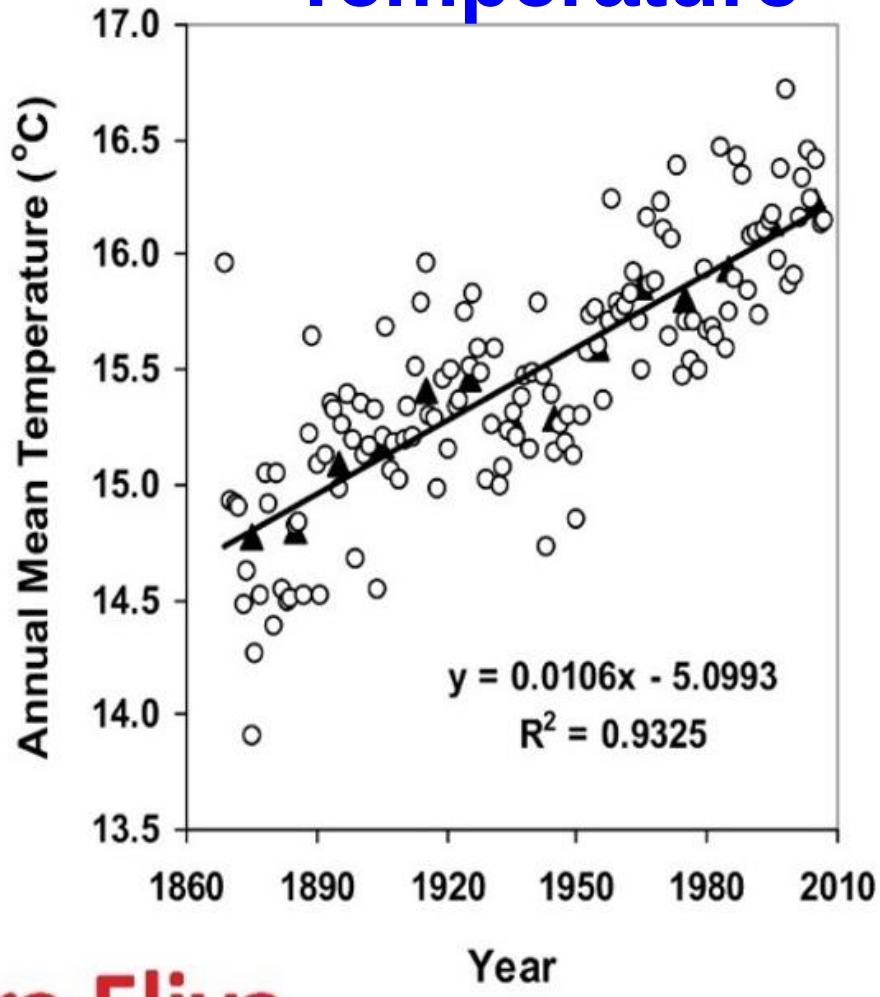
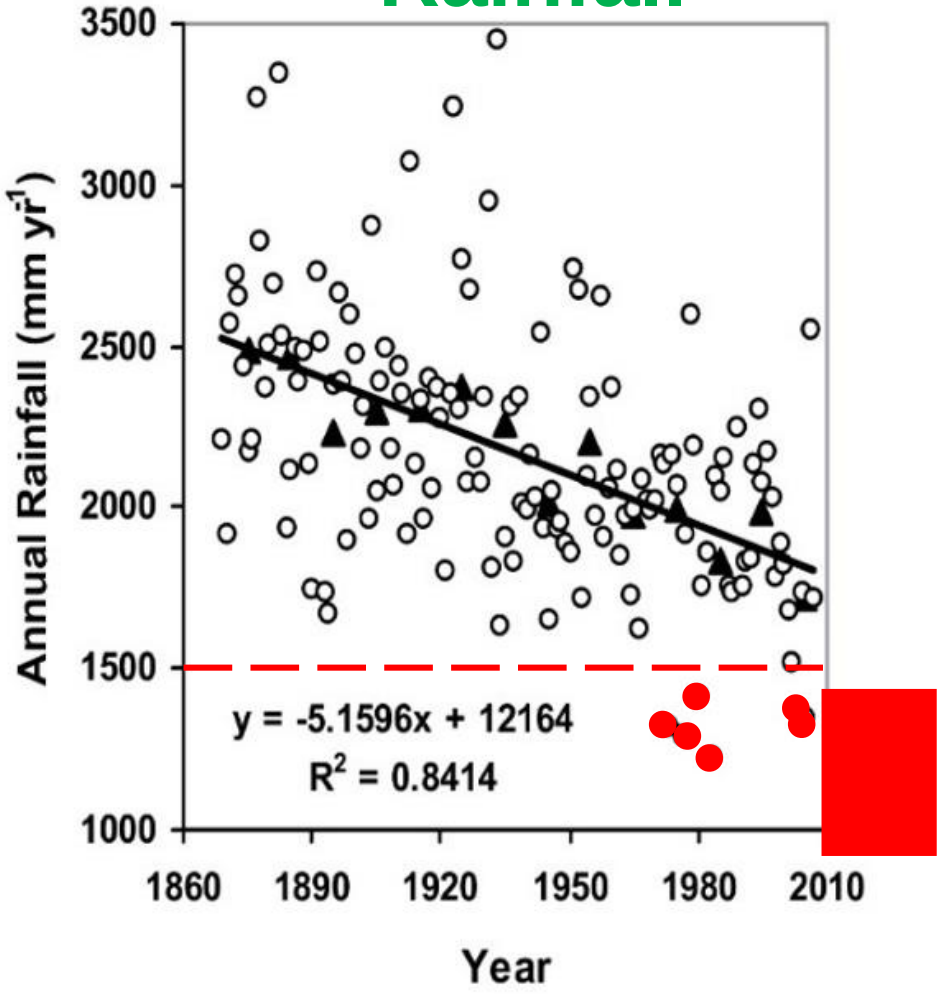
Temperature



Rainfall



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Chandni Navalkha: Mongabay

STAR

‘PASSIVE HOUSE’

70,000 sq ft

Energy Savings:

Overall: 70% @ < 25°C

Dehumidification: 90%

Heat pump: 73%

Architect: Vinod Jayasinghe Associates

STAR

‘PASSIVE HOUSE’

70,000 sq ft

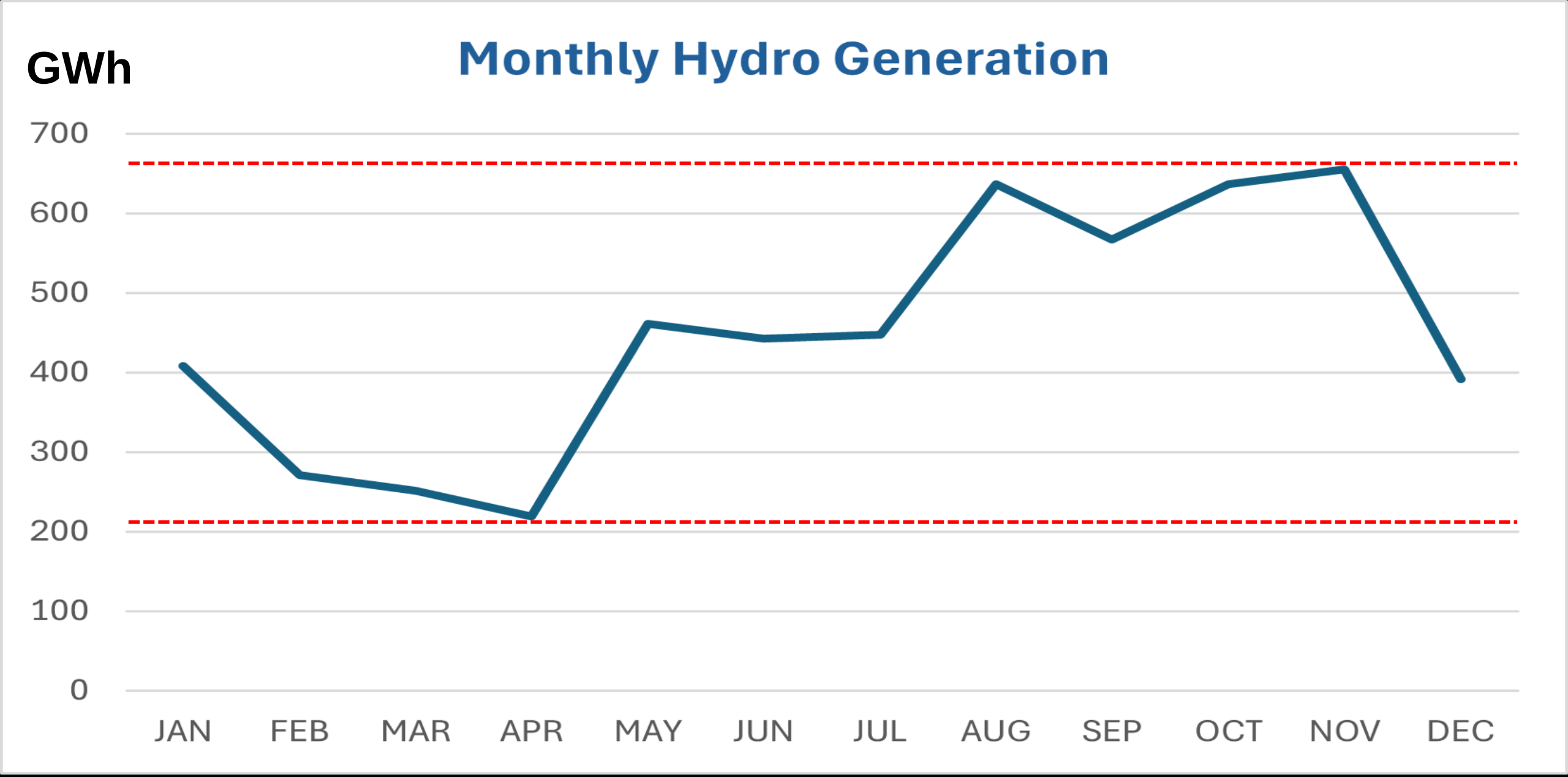
Energy Savings:

Overall: 70% @ < 25°C
Dehumidification: 90%
Heat pump: 73%

CO_2 < 1000 ppm

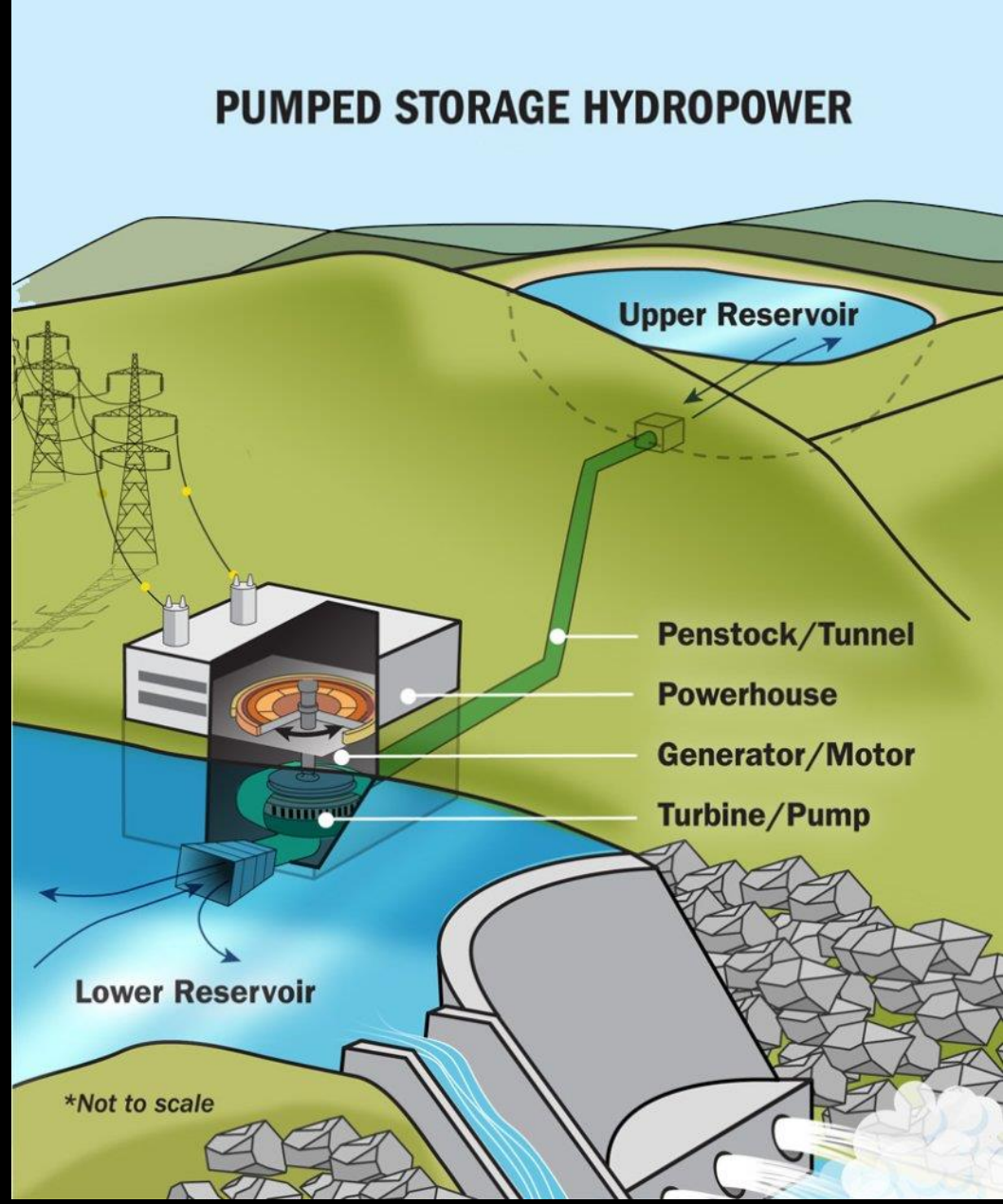
Ventilation 30 m^3/h/pax

Architect: Vinod Jayasinghe Associates



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

Pumped Storage Hydro accounts for 96% of all utility-scale energy storage in the US

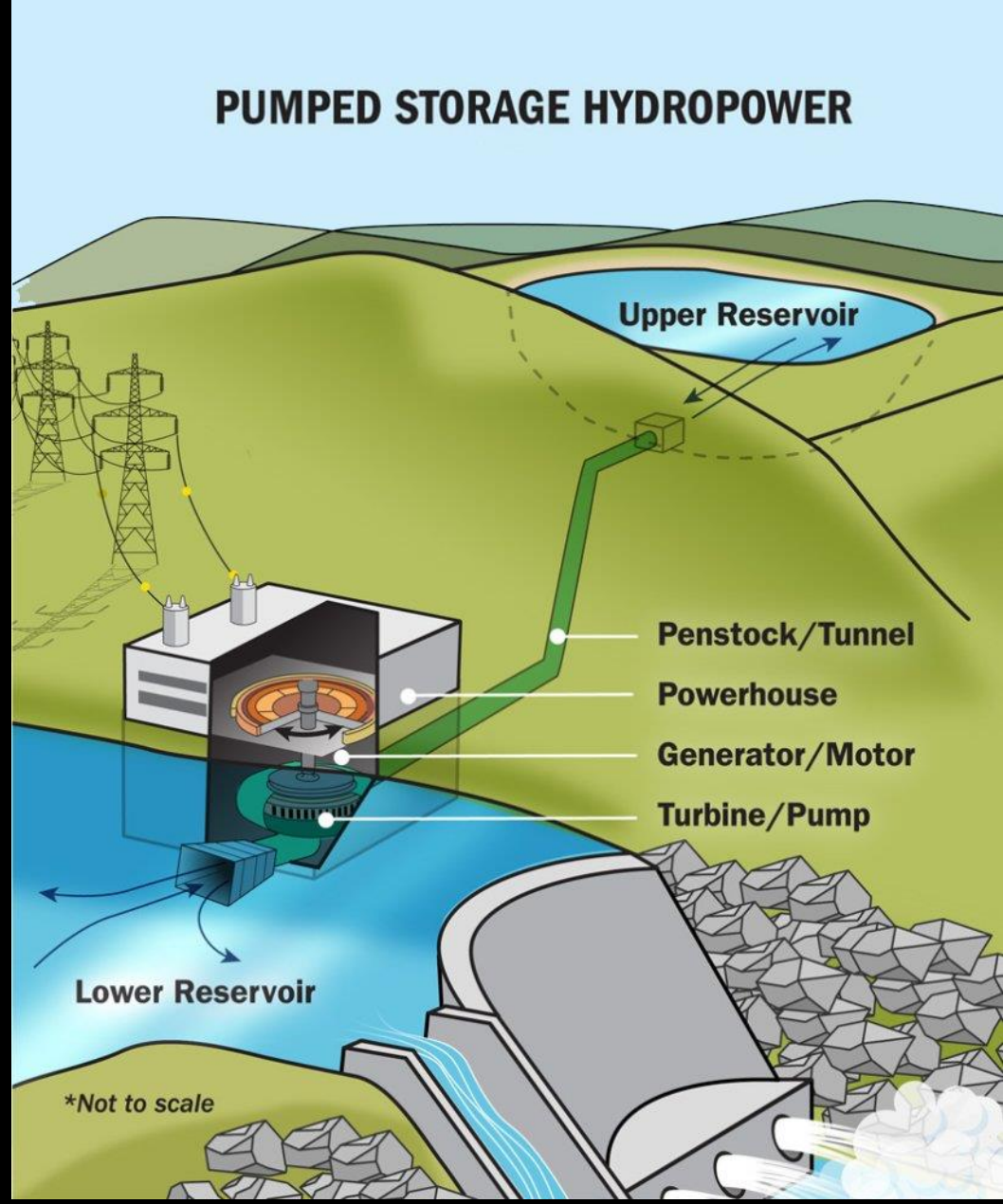


U.S. Hydropower Market Report, 2023 Edition.
https://www.energy.gov/sites/default/files/2023-09/U.S.%20Hydropower%20Market%20Report%202023%20Edition.pdf

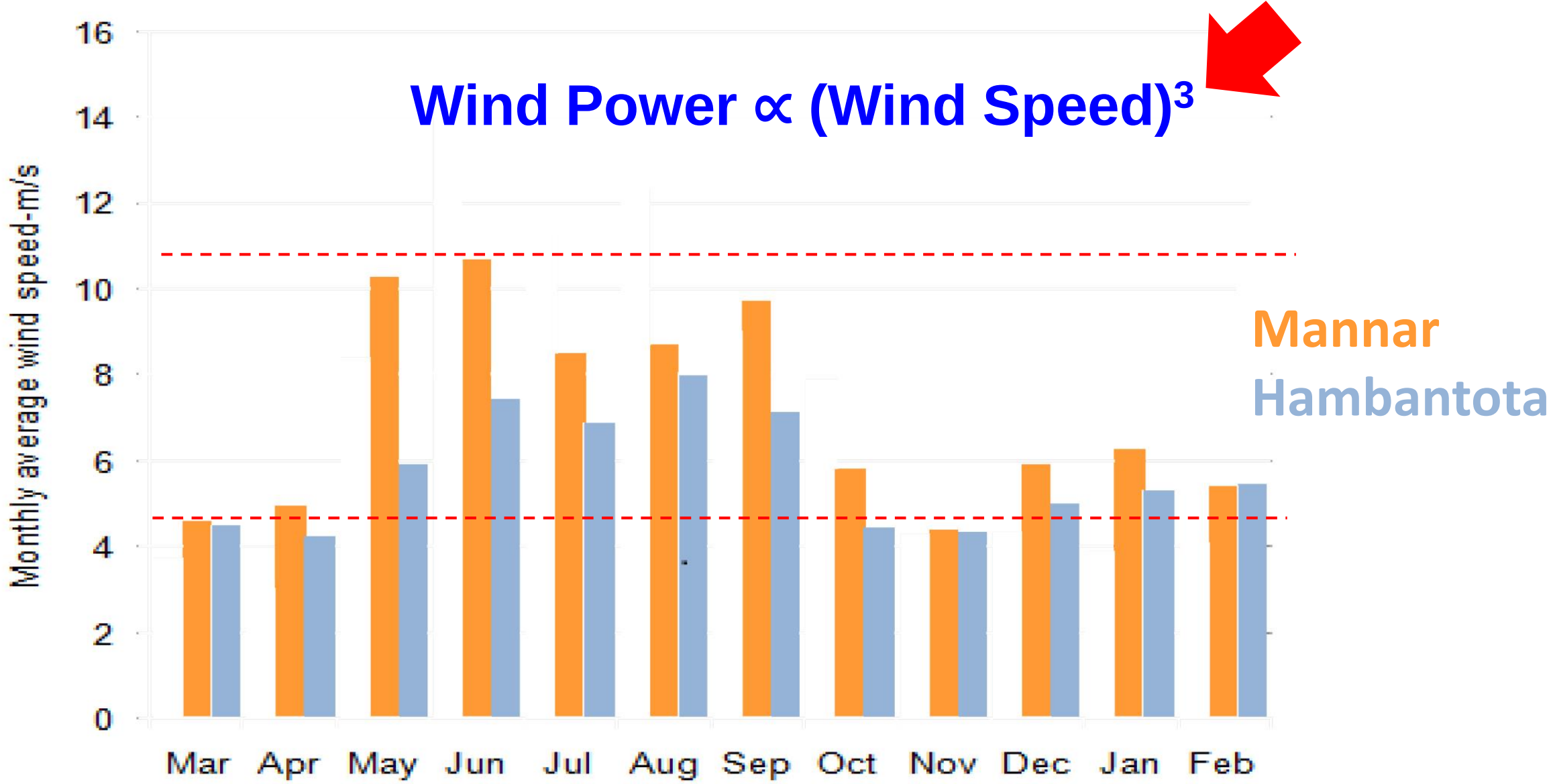
Pumped Storage Hydro accounts for 96% of all utility-scale energy storage in the United States

Norton-Castlereagh

Maskeliya-Canyon

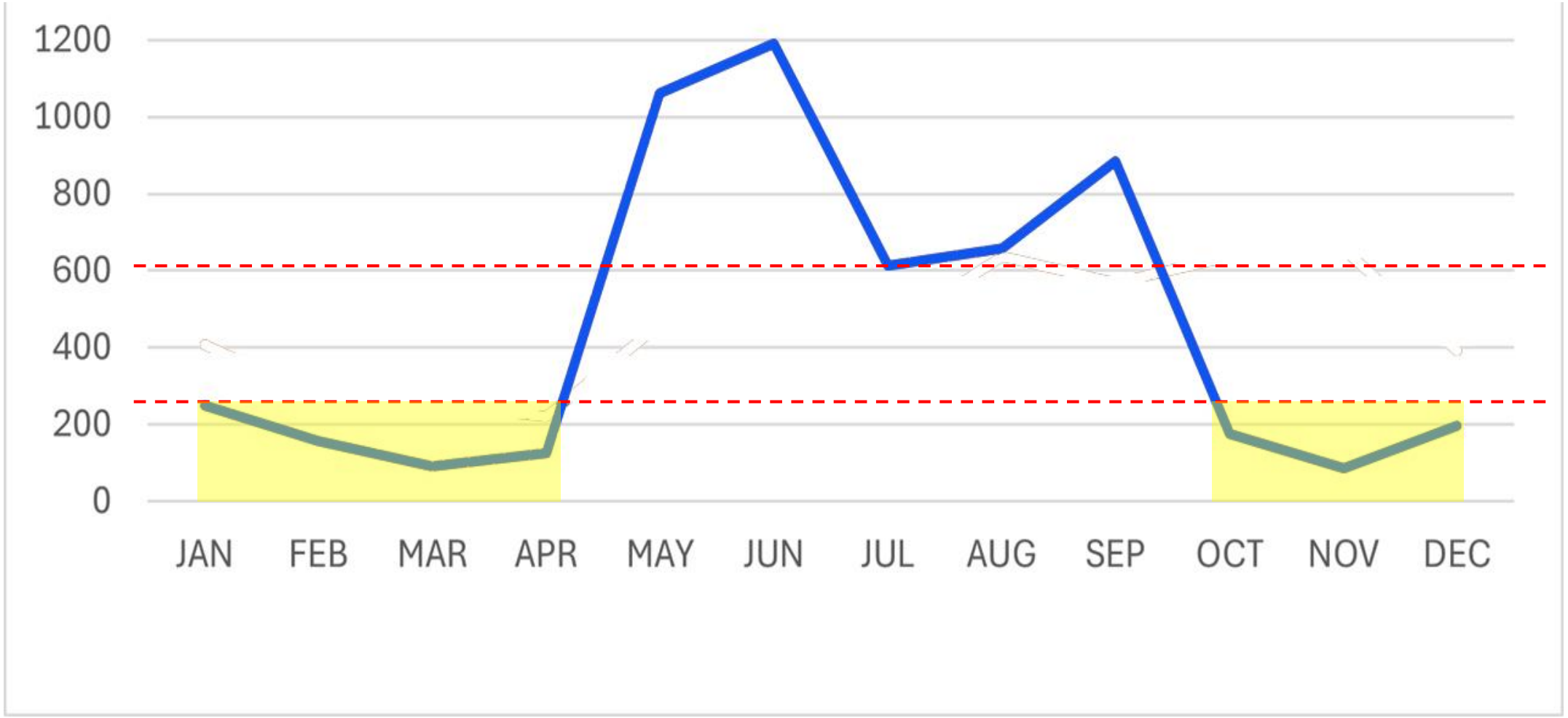


U.S. Hydropower Market Report, 2023 Edition.
https://www.energy.gov/sites/default/files/2023-09/U.S.%20Hydropower%20Market%20Report%202023%20Edition.pdf



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

Wind Power



Based on date in 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

DEPARTMENT OF METEOROLOGY
SRI LANKA

ADVISORY
2024-04-06

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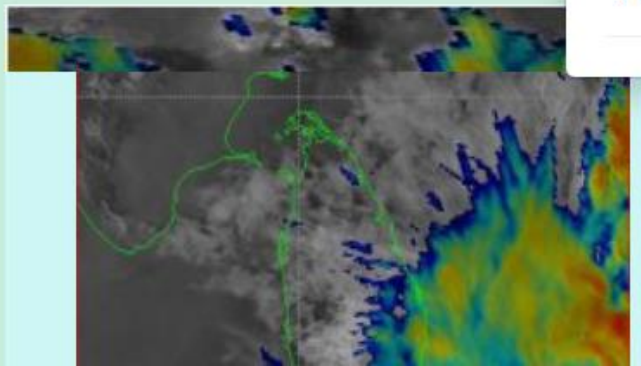
- WEEKLY RAINFALL ANOMALY FORECAST

SATELLITE IMAGES



URS

ture 36.9°C
Polonnaruwa / Vauniya

Min. Temperature 11.5°C
Nuwara Eliya

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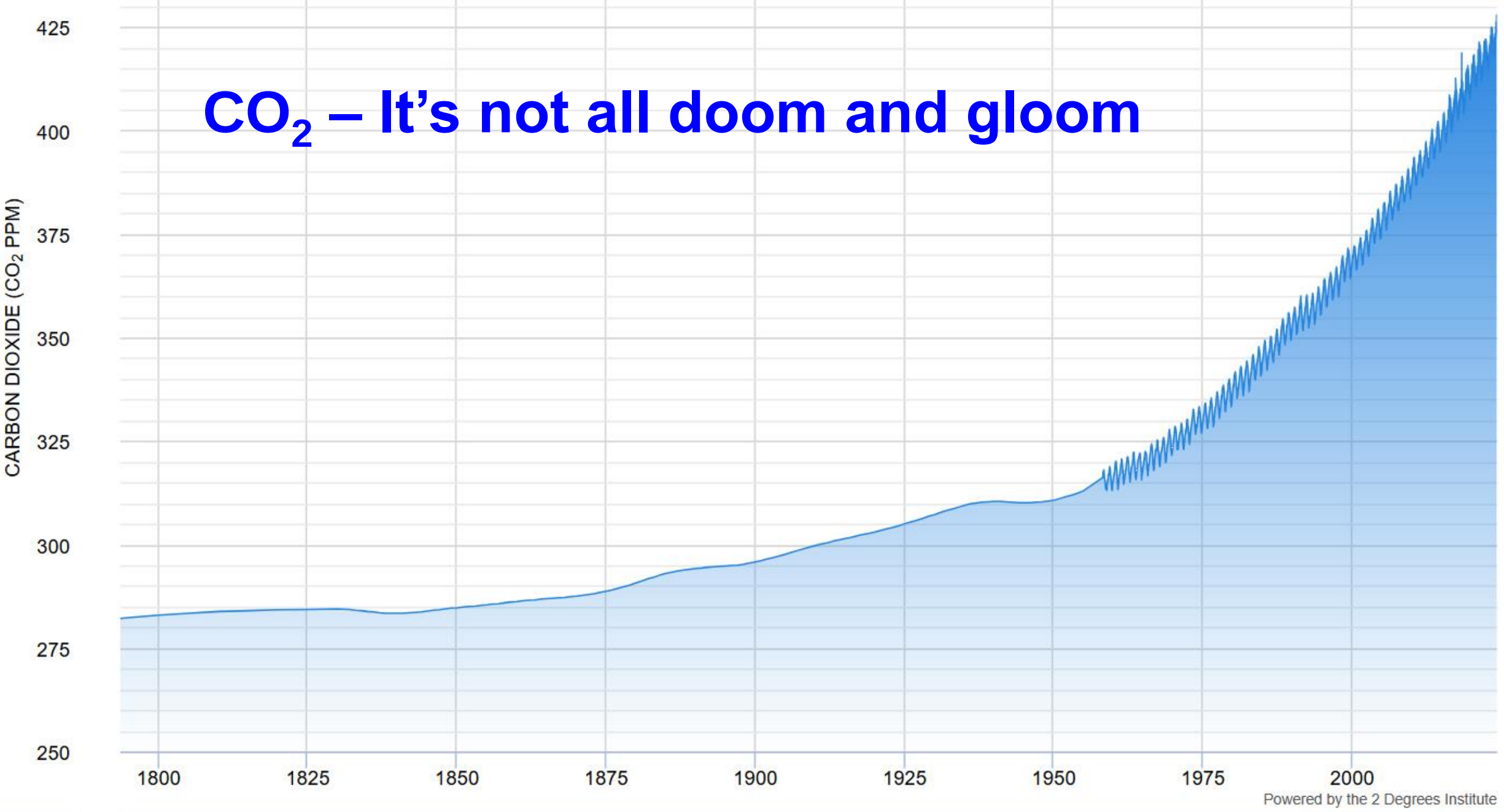
CO_2 – It's not all doom and gloom



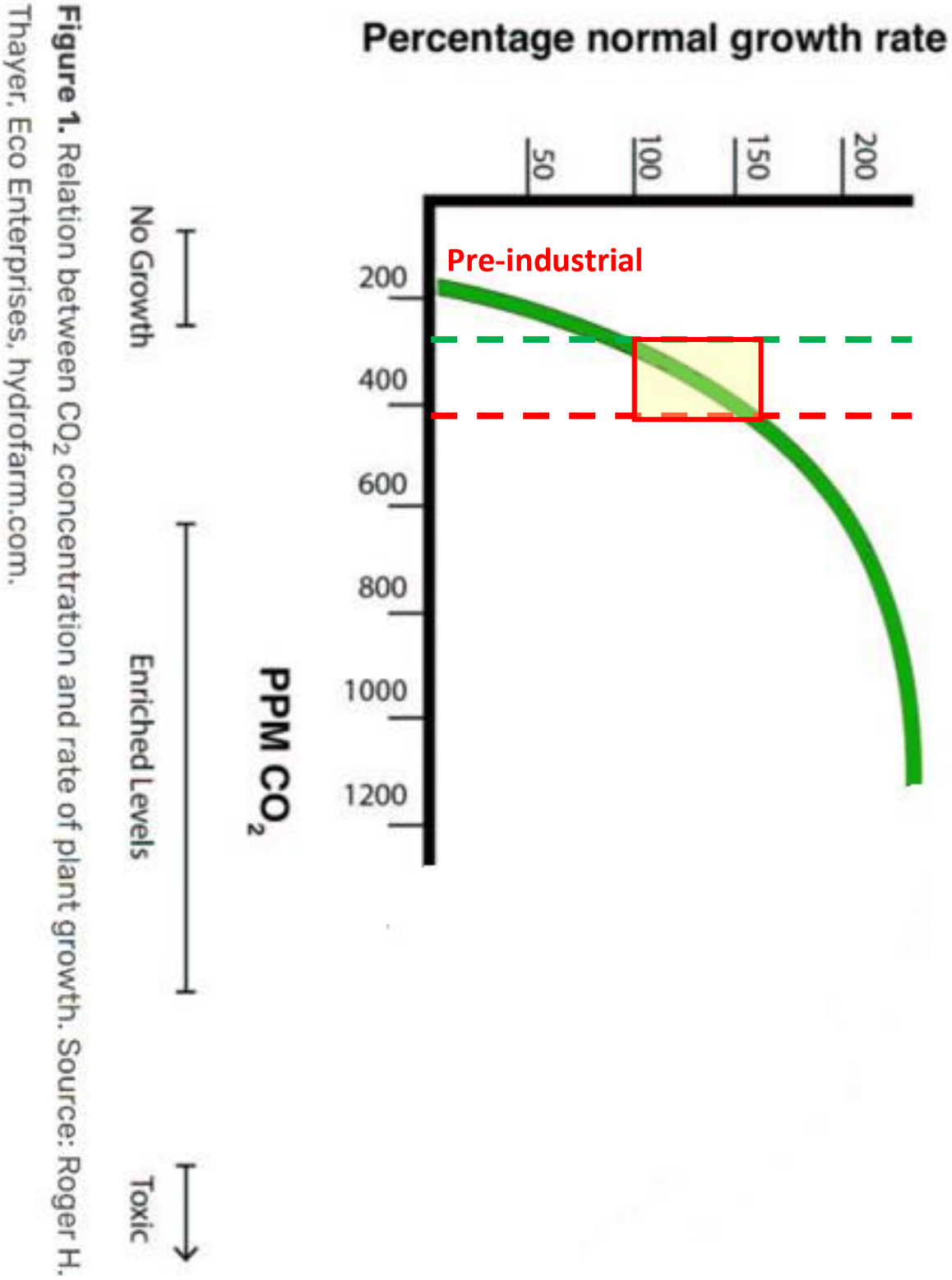


Figure 1. Relation between CO_2 concentration and rate of plant growth. Source: Roger H. Thayer, Eco Enterprises, hydrofarm.com.

Xu, Z., Jiang, Y., Jia, B. and Zhou, G., 2016. Elevated-CO_2 response of stomata and its dependence on environmental factors. *Frontiers in Plant Science*, 7, p.169580.

https://extension.okstate.edu/fact-sheets/greenhouse-carbon-dioxide-supplementation.html

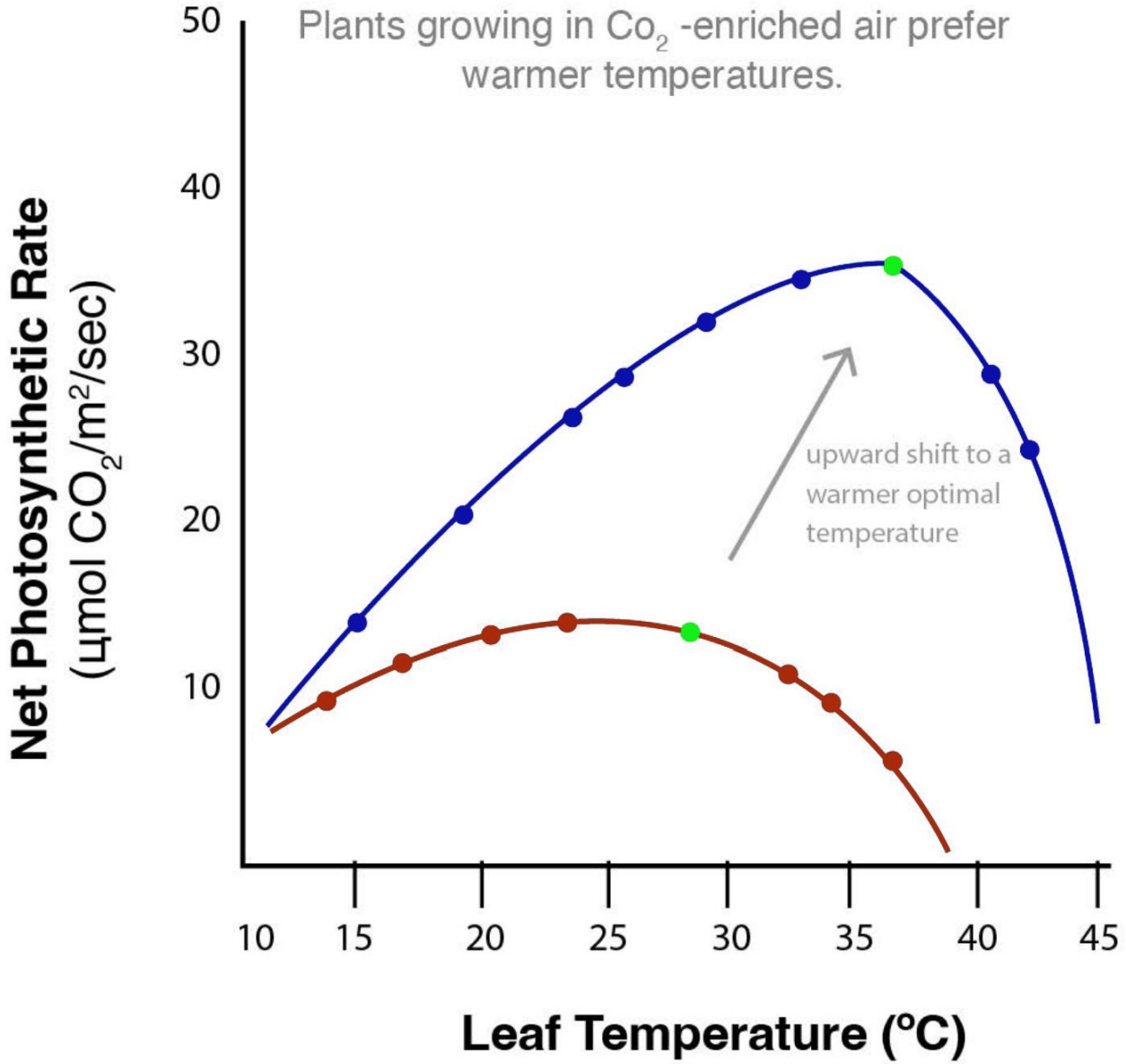
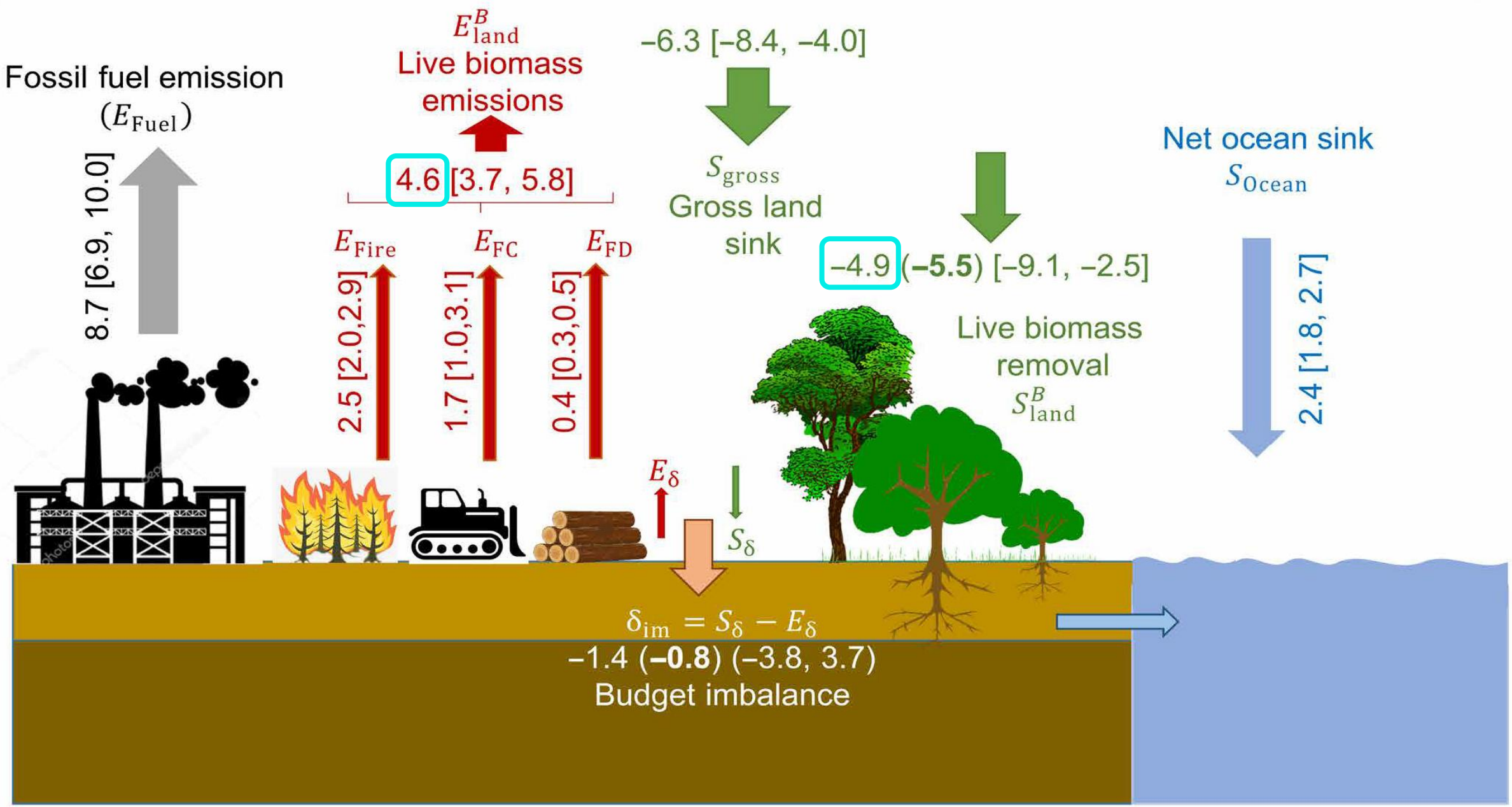


Figure 2. Relationship between leaf temperature and net photosynthetic rate at ambient and CO_2 elevated condition in Populas grandidentata (Jurik et al., 1984).

https://extension.okstate.edu/fact-sheets/greenhouse-carbon-dioxide-supplementation.html



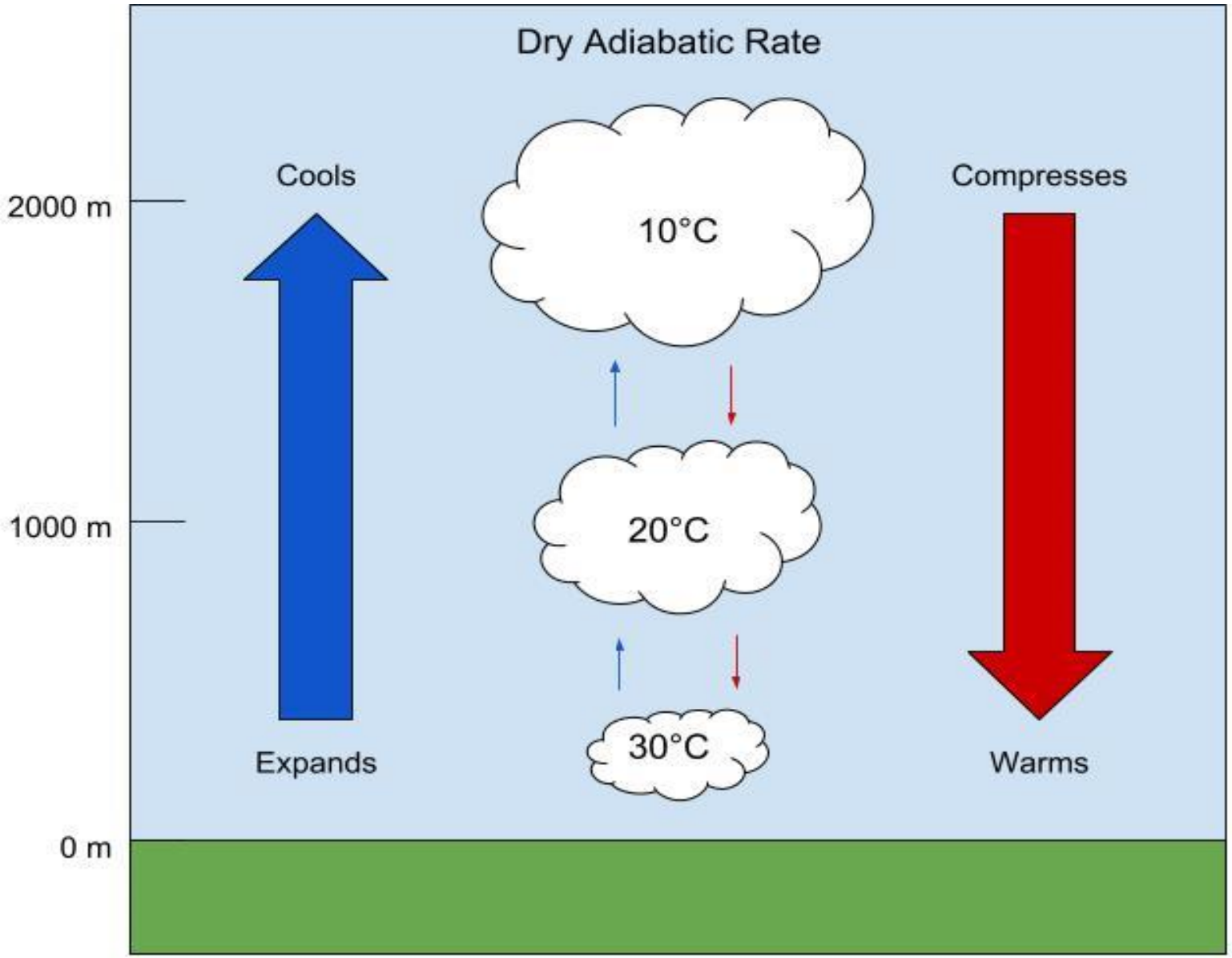
Xu, L., et al., 2021. Changes in global terrestrial live biomass over the 21st century. *Science Advances, 7 : eabe9829.* DOI: 10.1126/sciadv.abe9829

Vimukthi Weeratunga

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

Lapse rate ~ 0.5 °C / 100 m



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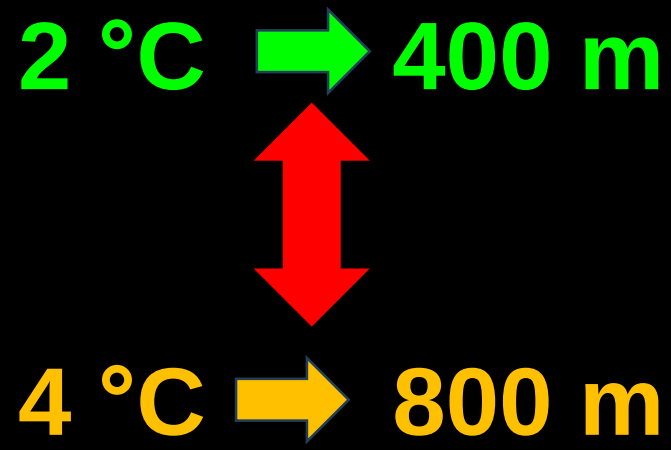
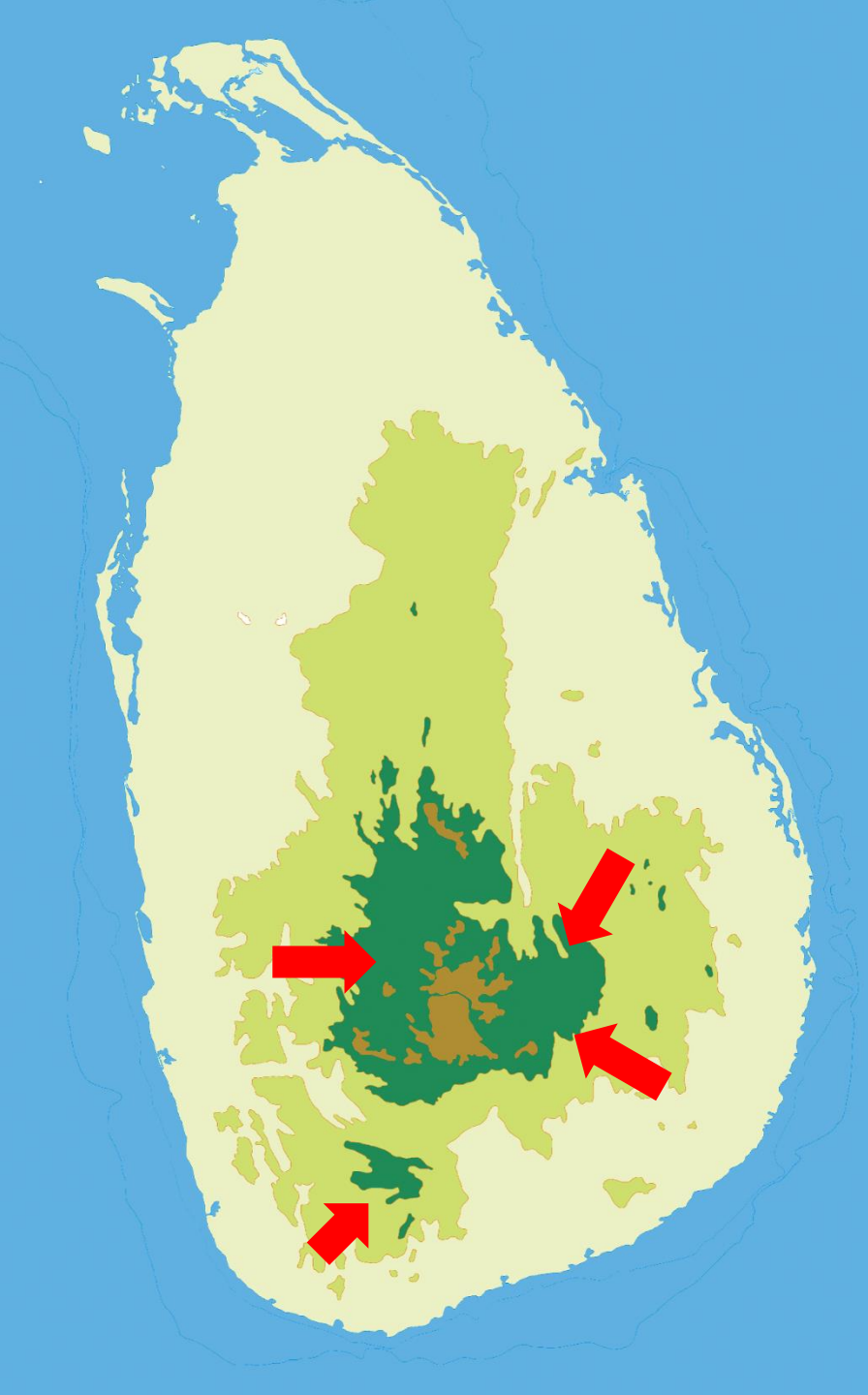
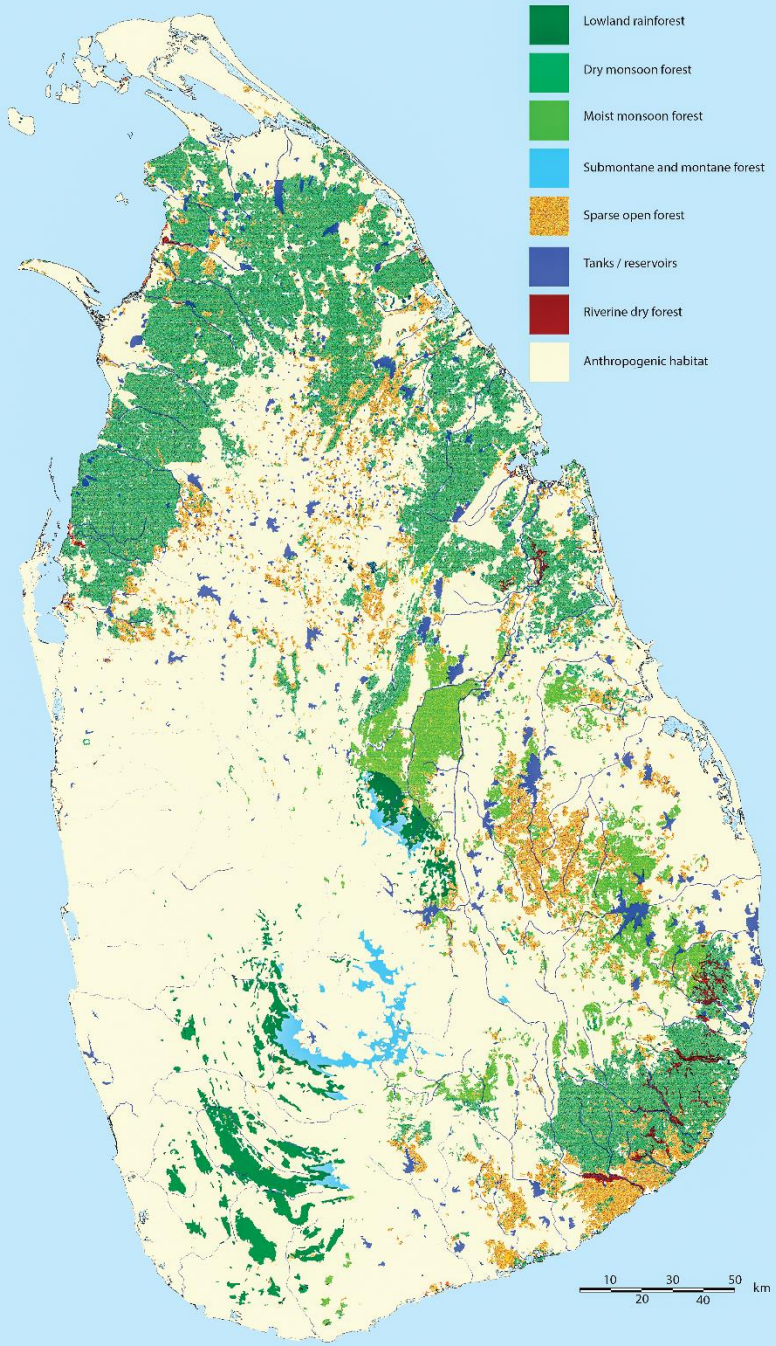
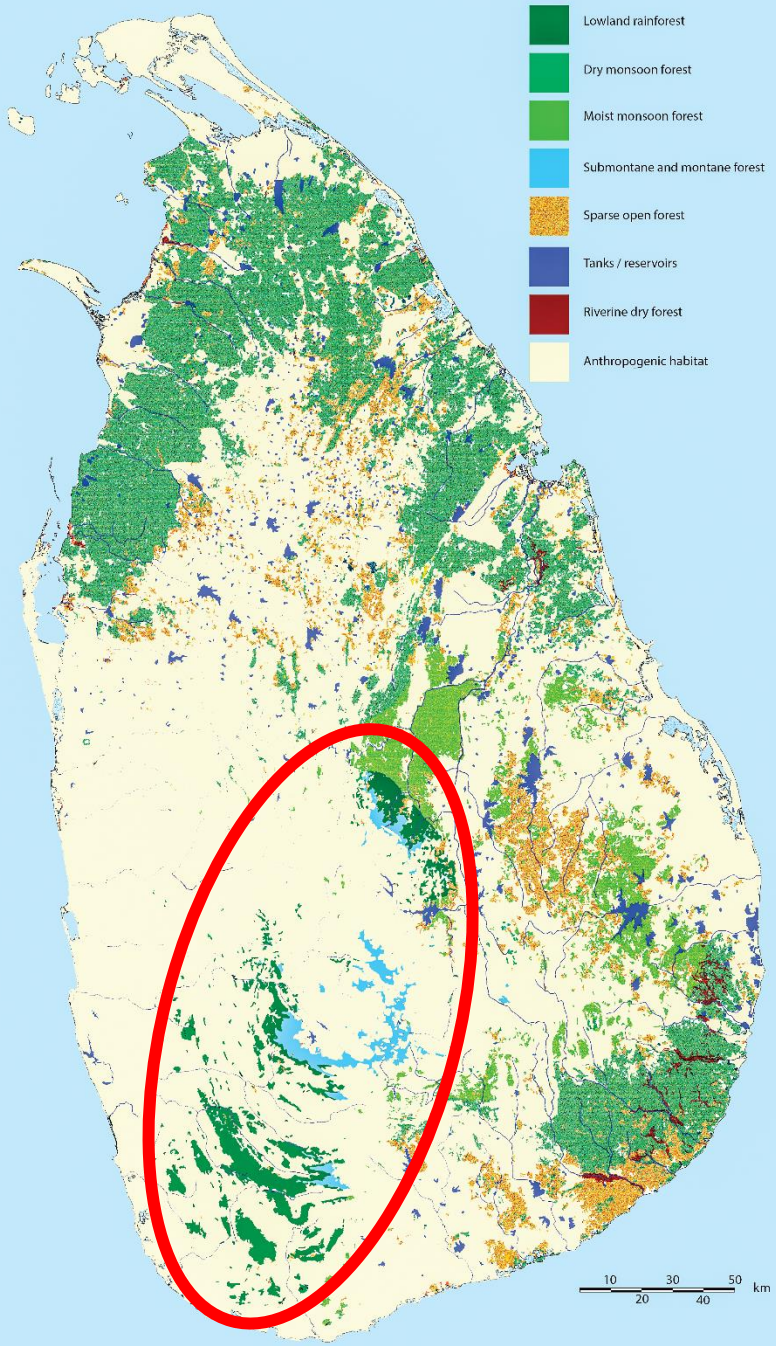





Lowland rainforest
Dry monsoon forest
Moist monsoon forest
Submontane and montane forest
Sparse open forest
Tanks / reservoirs
Riverine dry forest
Anthropogenic habitat
10
20
30
40
50
km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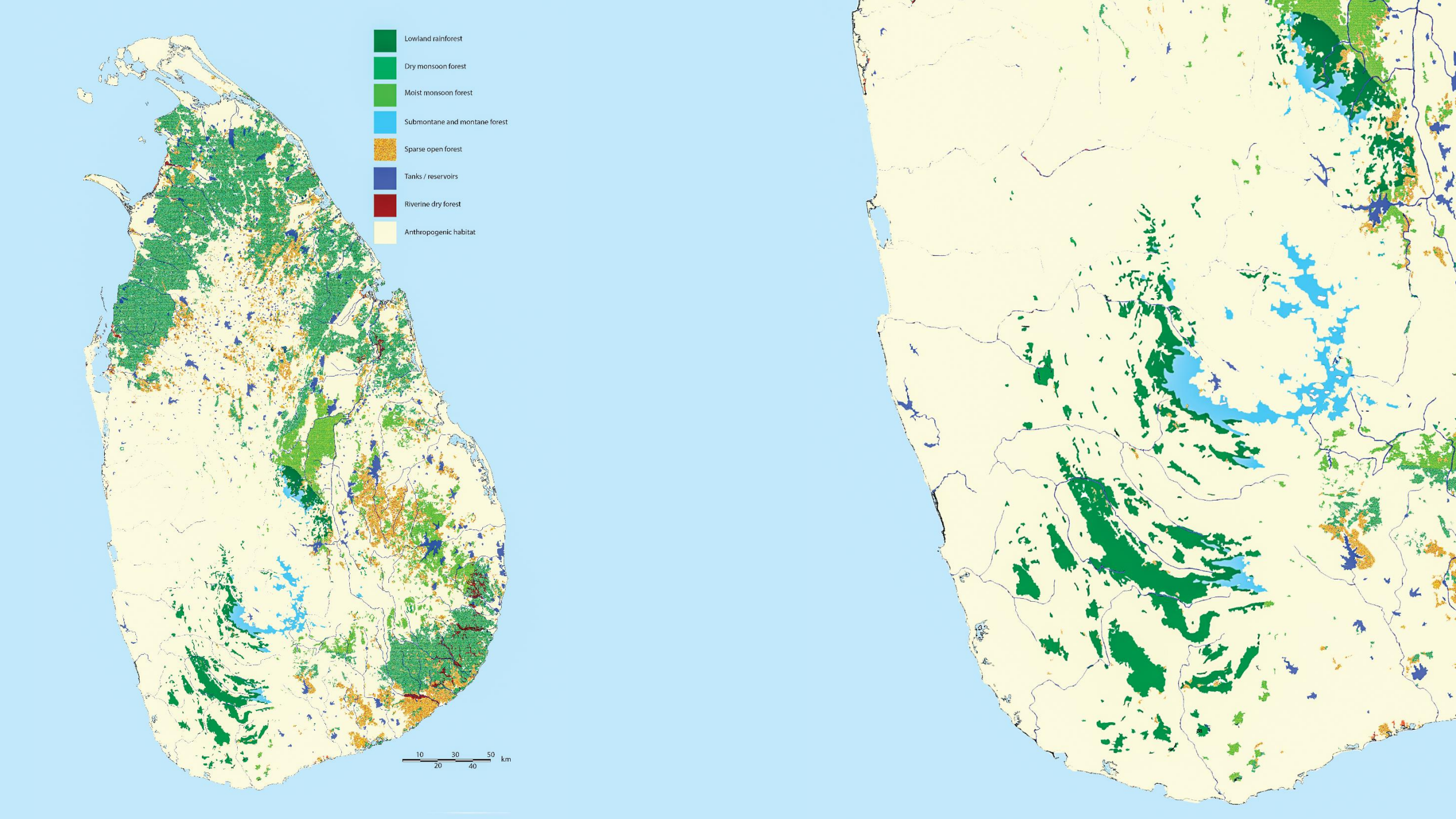
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Dilmah’s Forest Corridor at Endana

Dilmah Conservation

Dilmah Conservation

Stream & River Reservations

10.2 (a) Natural Streams should have the following reservations:-

Bed width		**Reservation from the bank**
Below 3 m	…	5 m for both sides
3 to 8 m	…	10 m for both sides
8 to 15 m	…	20 m for both sides
15 to 22 m	…	40 m for both sides

https://www.survey.gov.lk/sdweb/pdf/surveydocuments/DSR_6th_EDITION/chp_eng10.pdf

WNPS

PLANT

Hayleys – a massive step forward

- Create over 500 Acres of New Forest
- At least 20-30 kilometers of Continued Forest link corridors can be created
- Over 2500 Acres committed
- Five Plant Nurseries
- Above five thousand foot altitude locations to be enhanced.

- **Lots of challenging work ahead to deliver value**

Maskeli Oya: Creating a nine km forest corridor with Horana Plantations

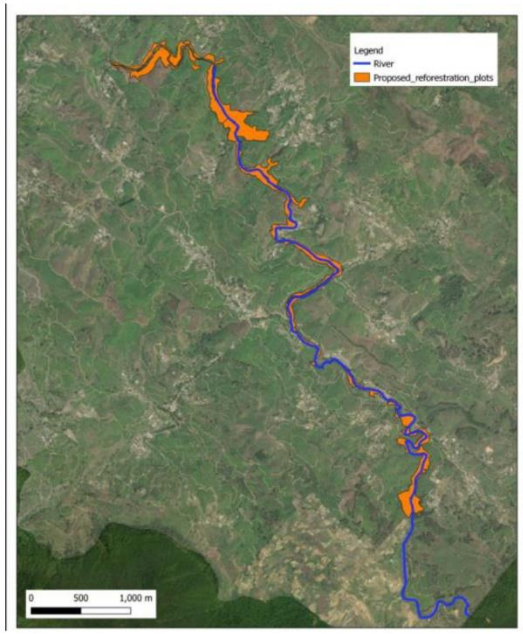
- Horana Plantations, agreed to release land strips parallel to the Maskeliya Oya waterway which runs through five of their estates.
- Creating a Forest Reservation of 30-50 feet on each side of the waterway, PLANT creating a Nine km long Forest Corridor which will be over 55 Hectares of new Forest.
- This Forest will connect upto the Peak Wilderness, and enable wildlife to travel and access protected spaces with minimal human contact.
- Issues such as the recent Leopard incidents in the hills are often due to the inability of animal to travel across location without human interaction
- The Project is broken into Five Units based on the five different Estates through which the Oya Runs
- The Marking of the new boundaries inside which Re-foresation will be done, was completed as of end August 2023. Foresting commenced in October 2023.
- We need donors who can fund any one of the five segments – Costs between Rs. 3.2 to Rs.3.9 mio per segment. Already a few segments are funded.

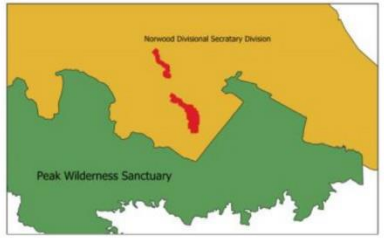
Sustainability/Environment

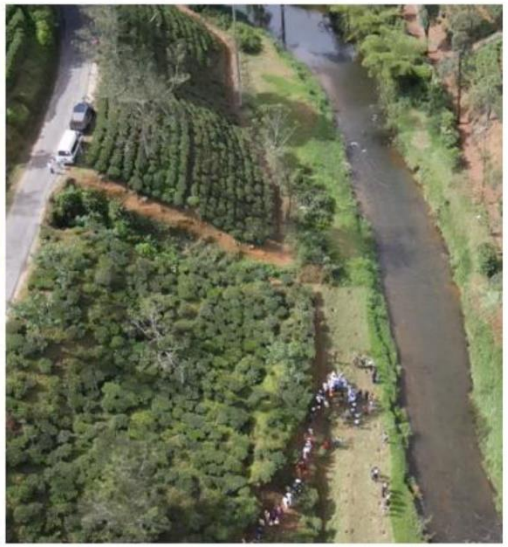
Horana Plantations and WNPS PLANT building ambitious 9km forest corridor

WNPS monthly lecture tomorrow to put spotlight on conservation of Asian elephant

Kicking off the project formally –Jan 24



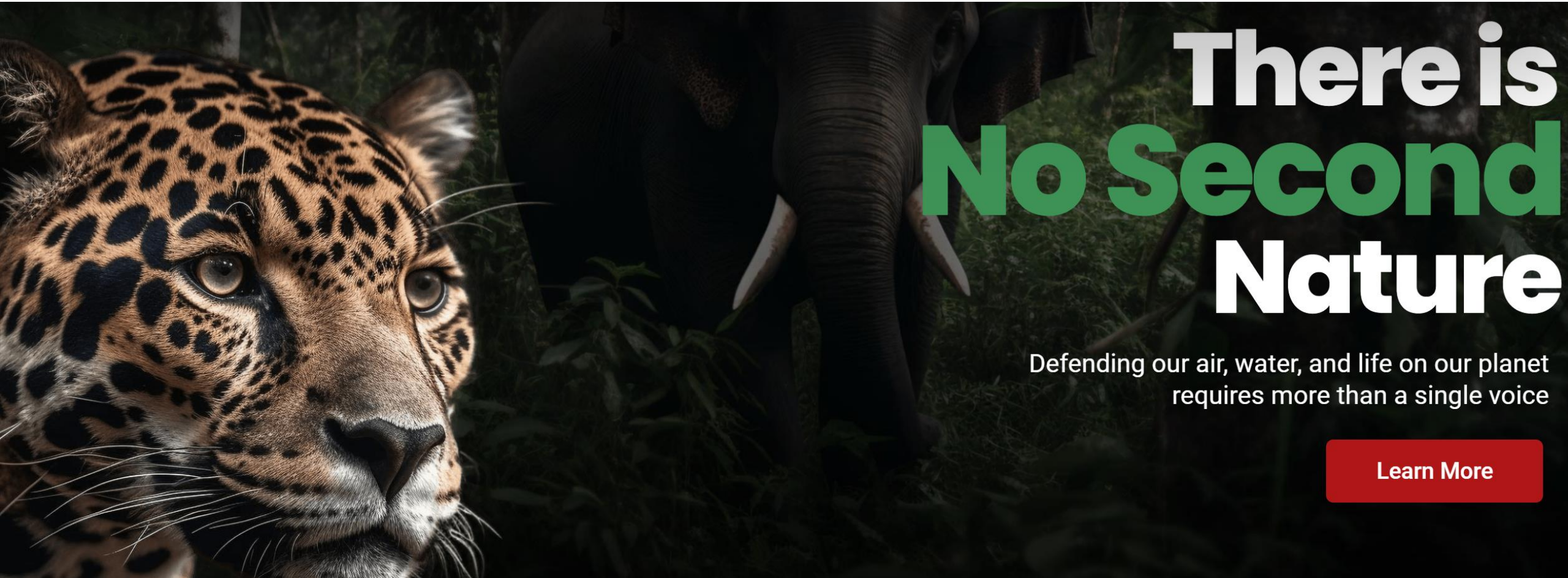




Images of the waterway banks which will be replanted on, to create forest passages

BIODIVERSITY SRI LANKA

Home Membership Projects News Events



There is No Second Nature

Defending our air, water, and life on our planet requires more than a single voice

Learn More

The Life Kanneliya

Establishing the biodiversity baseline in a 12 hectare block of degraded land, in the Kanneliya Conservation Forest, which has been cleared for cultivation and subsequently abandoned resulting in the colonization by the pioneer fern species *Dicranopteris linearis* (*Kekeilla*).


Jetwing
HOTELS
SRI LANKA


INSEE


Nations
TrustBank


HNB
YOUR PARTNER IN PROGRESS


DIMO
THE PERFECT PARTNER


virtusa


Dilmah
For lovers of tea


PLC
People's Leasing &
Finance PLC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சம்பத் வங்கி
Sampath Bank


CDB
Citizens Development
Your Friend


exp
EXPOLANKA LIMITED


Access
ENGINEERING


MAS
CHANGE IS COURAGE

WNPS PLANT

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