CODE RED SRI LANKA CLIMATE SUMMIT '24

The Ceylon Chamber of Commerce

Climate Impacts and Agriculture

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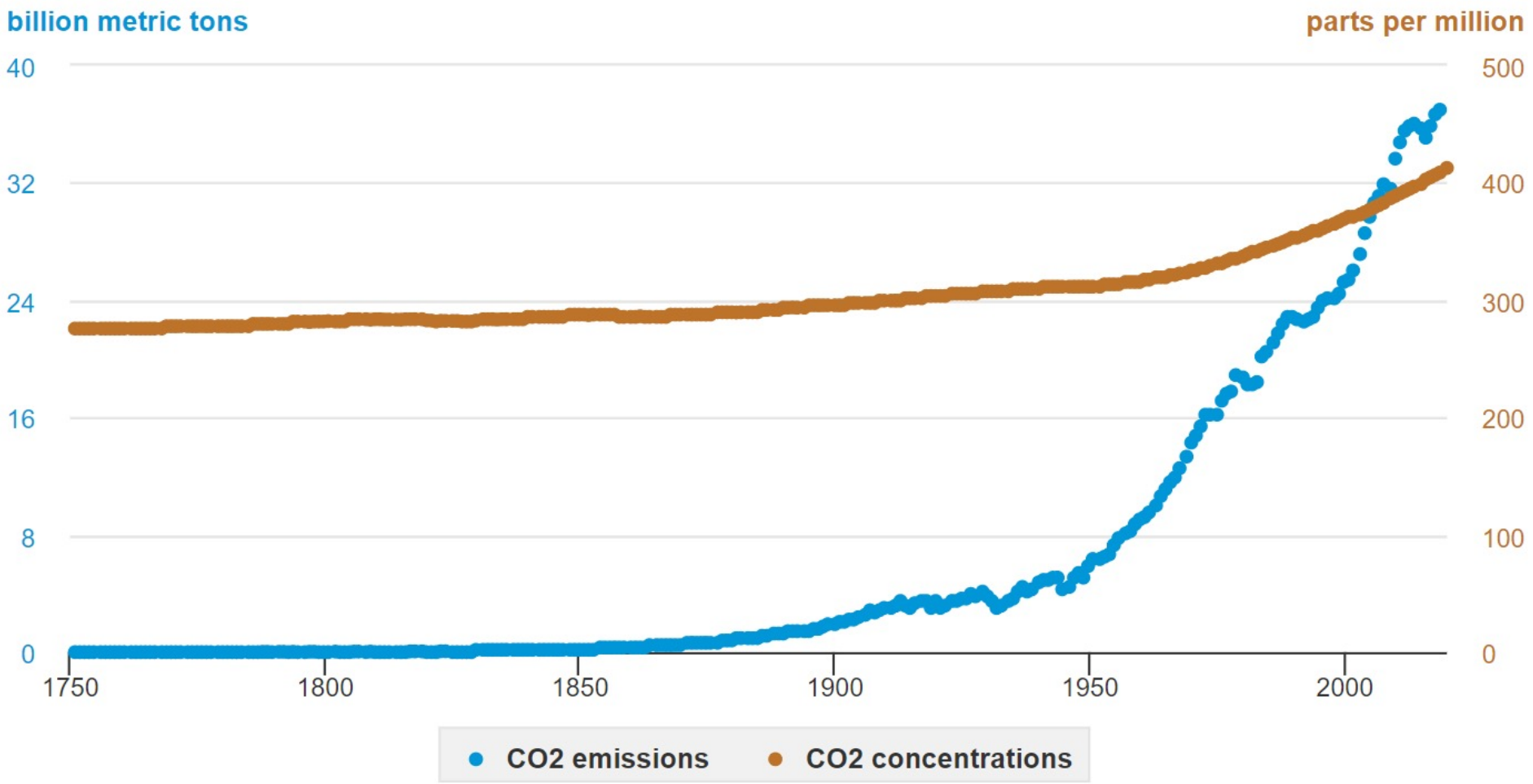
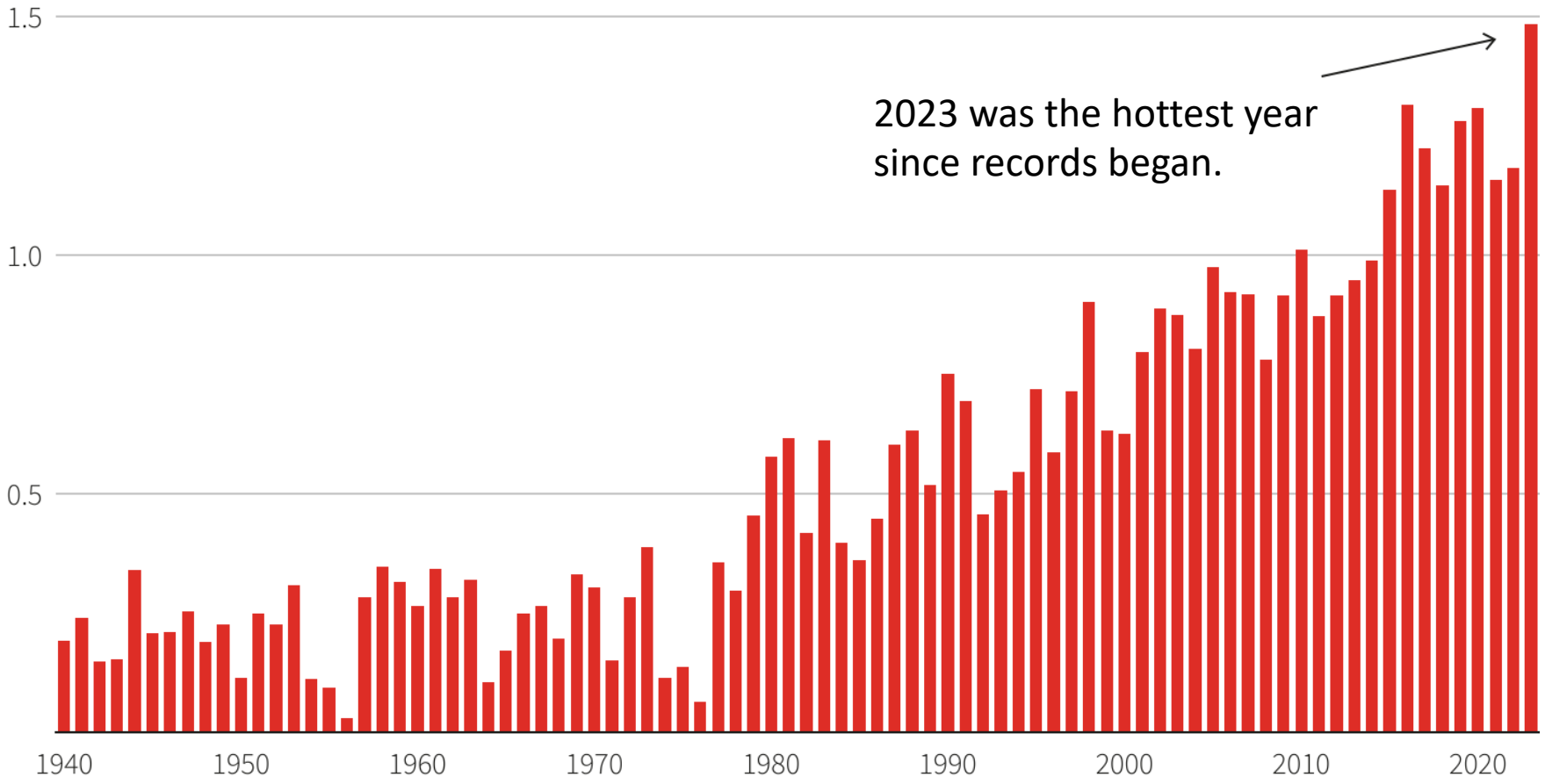
Sri Lanka Climate Summit 2024

World CO_2 emissions from Fossil Fuel Combustion and Global Atmospheric CO_2 Concentration



2023 was the world's hottest year on record

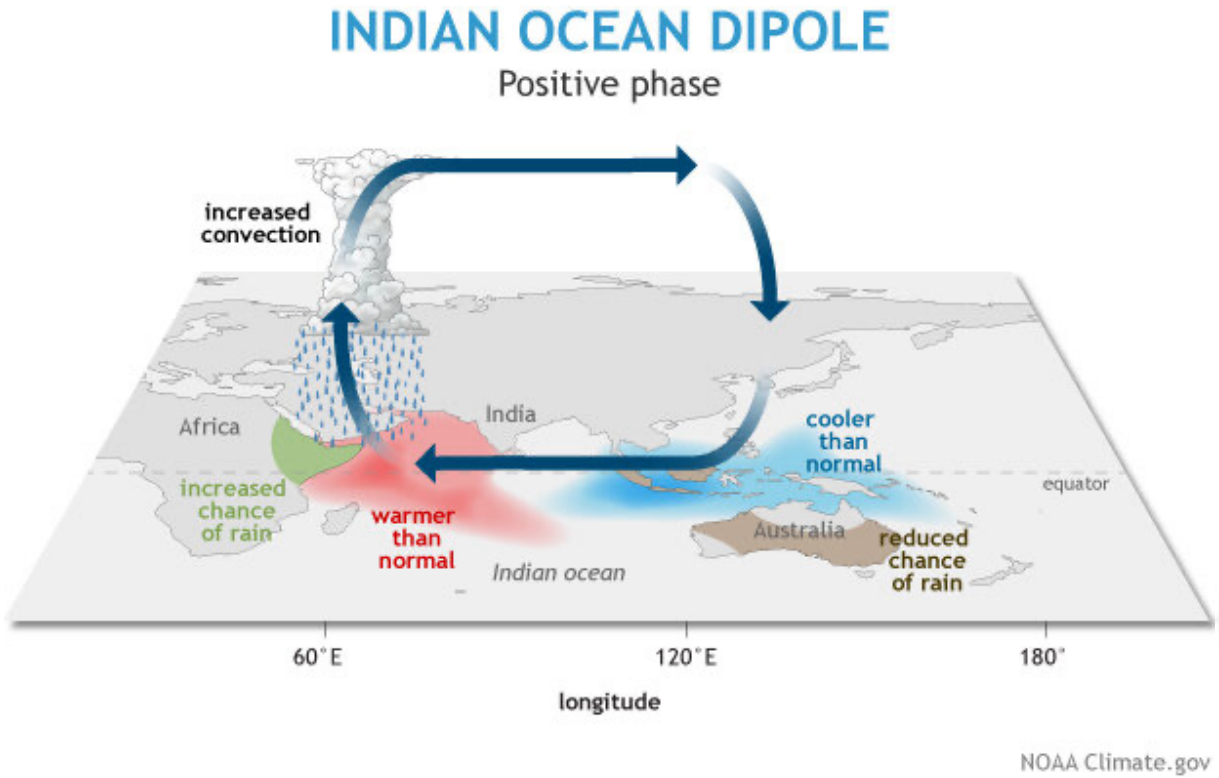
Global surface temperature increase versus the average during the 1850-1900 pre-industrial period (°C)

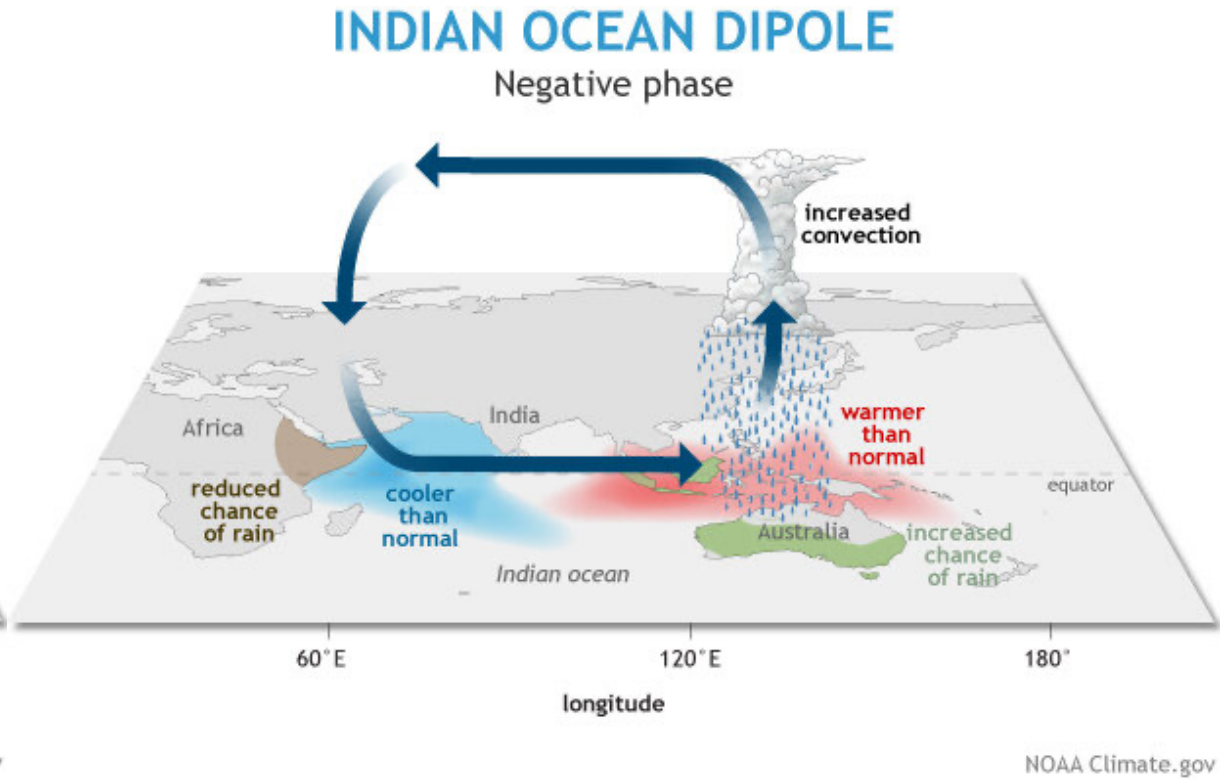


Source: Copernicus Climate Change Service/ECMWF

- The highest temperature was recorded in **2023**
- The second highest in **2016**

Indian Ocean Dipole (IOD)





SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

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The SDG 13:

Take urgent action to combat climate change and its impacts

Sri Lanka

- Three climatic zones
- Seven agro-climatic zones
- 46 agro-ecological regions
- Seven great soil orders
- More than 200 soil series
- The highest density of biodiversity in Asia
- One of the 36 Biodiversity hot spots
- Approx. 27% of flowering plants 22% of mammals are endemic

Climate change in Sri Lanka

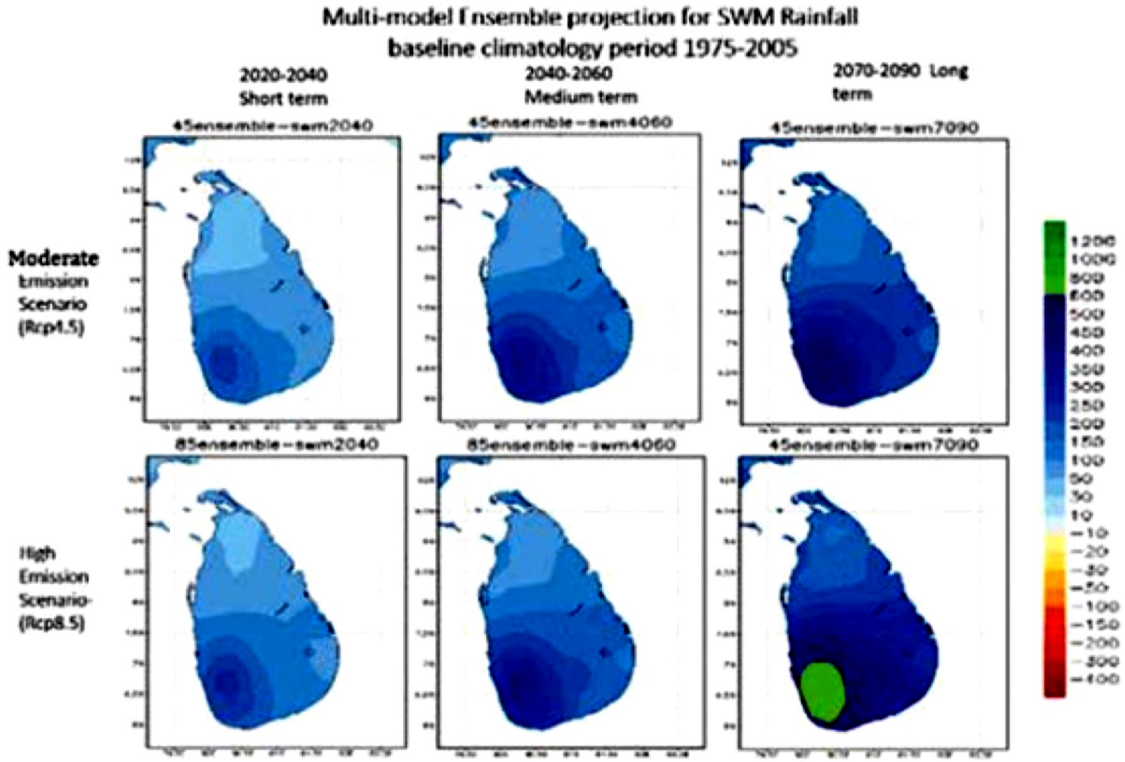
- Slow & continuous rise of ambient temperature

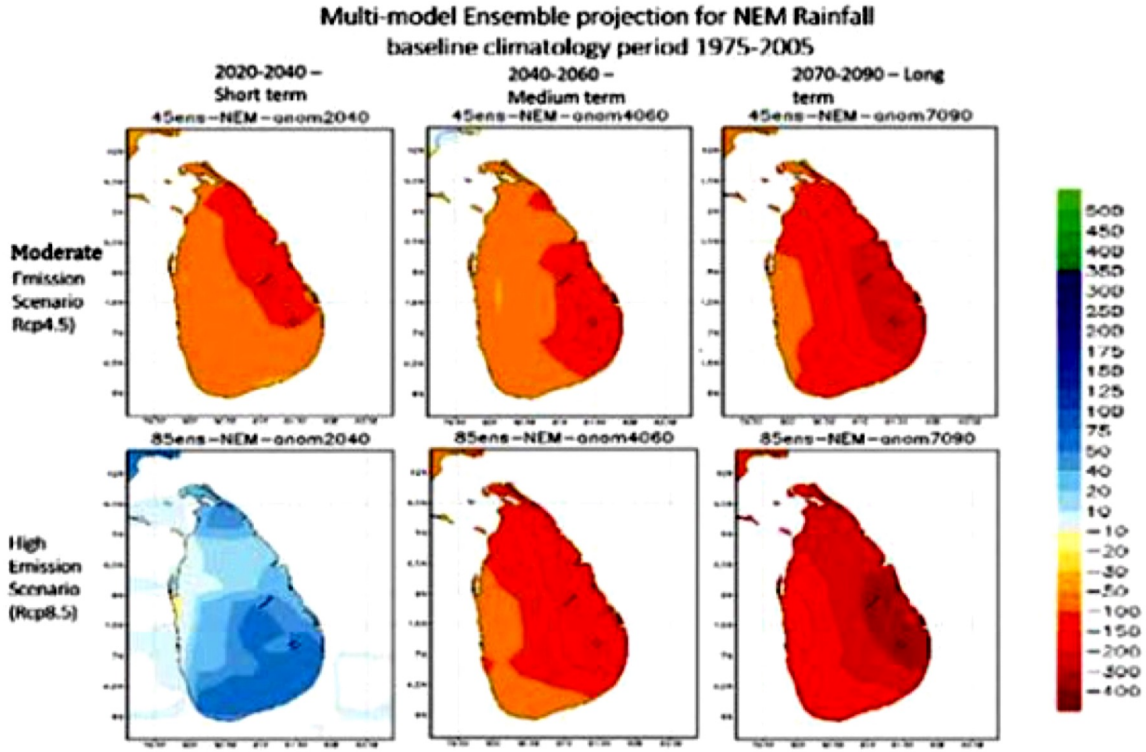
  (0.01 – 0.03 °C per year, since 1961)

- Frequent occurrence of extreme weather events
  - Droughts & floods : increased
  - High intensity rains – Land slides : increased
  - Tornado type winds : increased
  - Intense lightning strikes : increased
  - Total number of dry days : increased
  - Warm days : increased
  - Number of cold nights/comfort nights : decreased

Jayawardena et al. (2024); Marambe et al. (2012, 2013, 2015), Punyawardena et al (2010, 2013), Punyawardena and Premalal (2013), Nissanka et al (2015)

Climate Change in Sri Lanka - Future



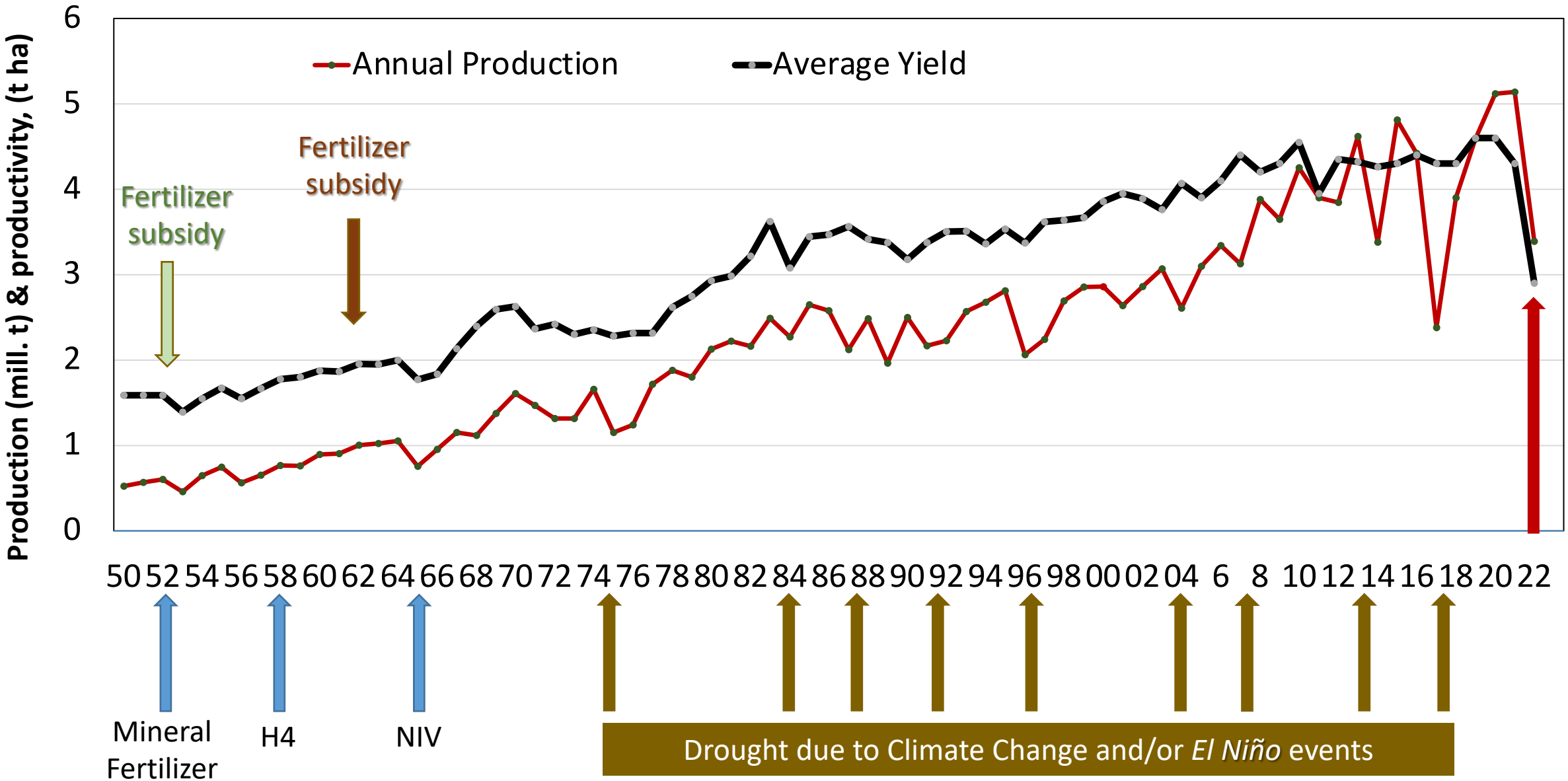


Jayawardena et al. 2024

Wet Zone becomes Wetter

Dry Zone becomes Drier

Changes in the national production & productivity of Paddy in Sri Lanka



Impacts of Climate Change on Agriculture

- Climate of the country has undergone a drastic change

  No rains when it is needed (drought)

  More rains when it is not needed (floods)

- Increasing temperature – direct and indirect impacts

Day/night temperature difference

- Night temperature is increasing at a faster rate than the day temperature (especially in cooler climates)

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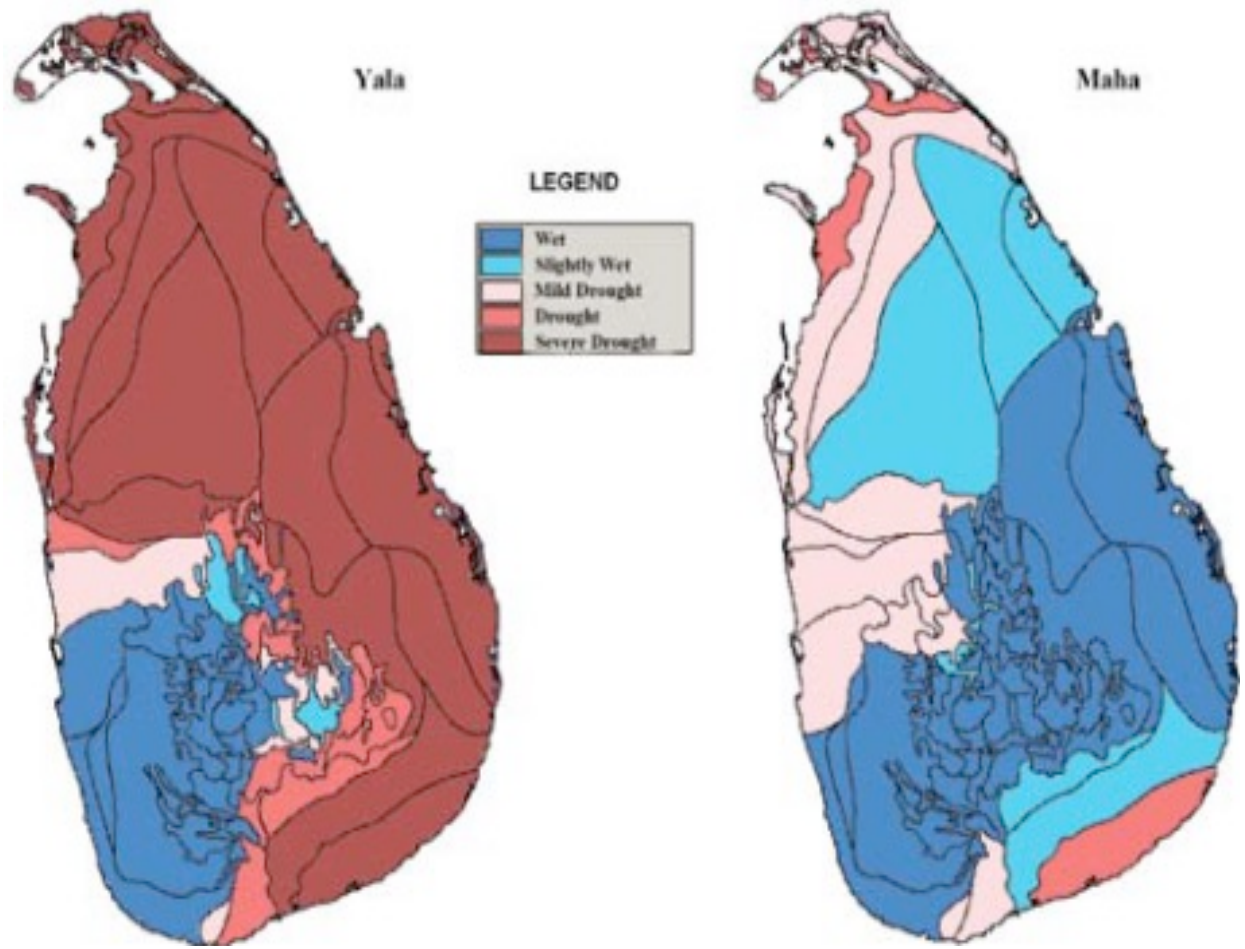
Buddhi Marambe, Climate Action for Our Nation and the Planet, 7-9 May 2024, SHANGRI-LA, Colombo

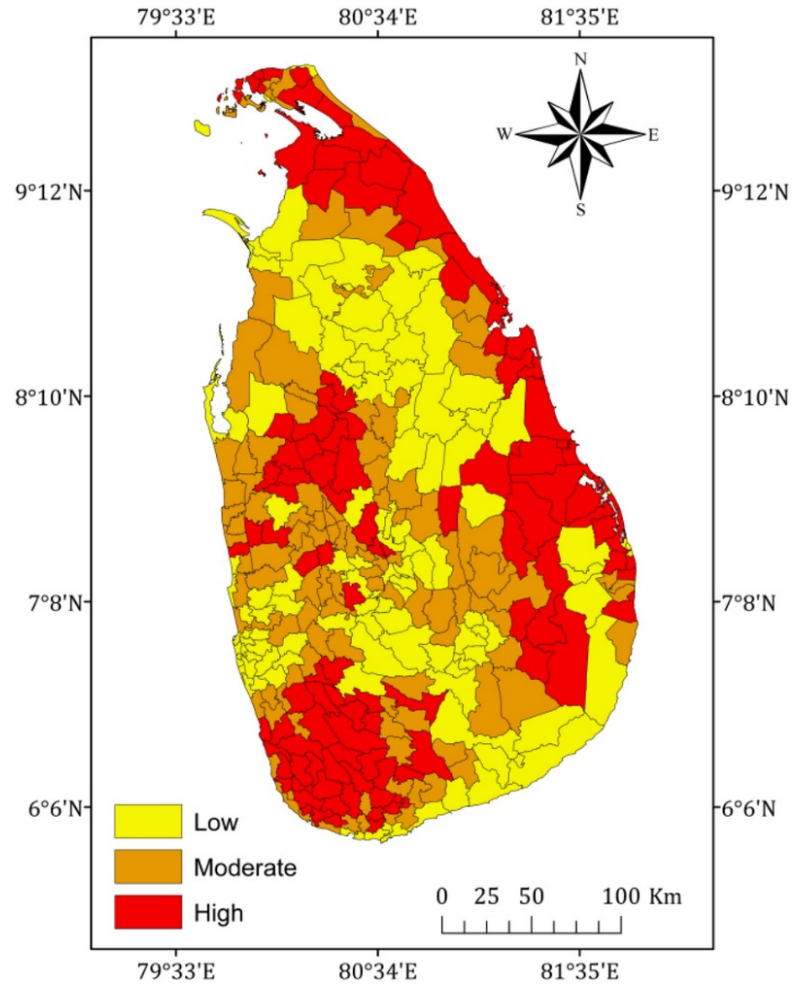
Economic Impacts of Climate Change

- Damages due to recurring disasters – **US$ 7 billion** (1990 -2018; UNDRR 2019).
- Damages due to flooding (1990-2018) - **over US$ 2 billion** (half of which occurred in 2016)
- Annually expenditure on climate-induced post-disaster contingent liabilities:

  LKR 50 billion (approx. US$ 167 million), **around 0.4% of GDP** (UNDP 2023).



Spatial pattern of drought severity Chithranarayana and Punyawardena 2008)



Vulnerability in Agriculture Sector at Divisional Secretariat Level (Wickremasinghe et al. 2021)

Climate-Smart Agriculture in Sri Lanka

Climate-smart agriculture (CSA) considerations

(A) Agriculture is the mainstay of Sri Lanka's rural economy. Given the country's diverse agro-ecological conditions and landscapes, smallholder farmers, who make up the overwhelming majority of the country's 1.7 million farmers, have long sought ways to build resilience of the food system under increased change and variability in climate.

(A) (P) Conservation of genetic diversity of indigenous crop varieties is the foundation for the sustainable development of new varieties that address present and future challenges. Resource-poor farmers have used intelligently genetic diversity over centuries to develop varieties adapted to local environmental stresses. Similarly, the preservation of genetic variability in indigenous livestock has enhanced resilience to changing climate conditions in native dairy stocks.

(A) (P) (Institutions) Access to new, climate-adapted genetic material is ensured by the Department of Agriculture (DA), which implements crop germplasm collection and systematic crop comparison programmes that target farmers in different agro-ecological regions.

(A) (P) Rainwater harvesting techniques, crop diversification and livestock integration, mulching and thatching, and micro-irrigation are key CSA practices adopted in Sri Lankan homegardens. Such activities, predominantly undertaken by women, represent important entry points for advancing adaptation, mitigation, and productivity goals, but also for acknowledging and encouraging women's critical role as knowledge heirs, decision makers and environmental stewards.

(A) (P) Climate-resilient crop varieties, particularly in rice paddy, have helped improve both household and national food and nutrition security. Rainwater harvesting systems and micro-irrigation techniques have improved water-use efficiency, while cover crops and shade management have helped to overcome heat stress and improve productivity in several production systems.

(P) CSA practices that address water salinization and soil degradation and erosion are critical for ensuring the productivity and sustainability of important food and export crops such as potato and tea. Reducing synthetic fertilizer and pesticide use through mulching, thatching, and agroforestry systems, among others, can ensure that water and soil quality are not compromised when aiming for productivity increases.

(A) (M) (P) Land productivity and resilience has been also achieved through the adoption of perennial cropping systems and short-duration and agro-ecologically adapted plant varieties, while emissions reduction and carbon sequestration have been a consequence of CSA practices such as crop–animal integration, manure production, and reduced use of chemical inputs. However, adoption levels of these efforts are generally low, especially among small-scale farmers.

(M) (Institutions) There is a need for greater state support for mitigation efforts through policies curtailing excessive use of synthetic fertilizers, which has a high share of total agricultural emissions. These should be complemented with efforts to increase public environmental protection awareness through, for instance, providing farmers with information on improved fertilizer management practices, nutrient management, and judicious combination of organic and inorganic fertilizers, among others.

(Institutions) ($) Adoption of CSA practices requires institutional support, especially for smallholder farmers. In particular, medium- and long-range seasonal climate forecasts, better intra- and inter-institutional coordination, and improved market access by smallholders are prerequisites for increased CSA adoption in Sri Lankan agricultural systems.

(Institutions) ($) Additionally, innovative knowledge management systems should be developed to promote adoption of knowledge-intensive CSA technologies aimed at strengthening farmers' knowledge of CSA practices, facilitating sharing the techniques, and providing support to local and indigenous knowledge systems.

(A) (M) (Institutions) ($) Compliance and voluntary markets are important instruments for enhancing climate resilience, reducing greenhouse emissions, and generating carbon credits, while contributing to the social, economic and environmental development of Sri Lanka.

($) (Institutions) (M) The development of governance and institutional framework supported by legal and regulatory frameworks is critical for maximizing the opportunities for climate finance mobilisation and emissions trading in the various sectors of the economy.

(A) Adaptation (M) Mitigation (P) Productivity (Institutions) ($) Finance

The climate-smart agriculture (CSA) concept reflects the ambition to improve the integration of agriculture development and climate responsiveness. CSA aims to achieve food security and broader development goals under a changing climate and increasing food demand. CSA initiatives sustainably increase agriculture productivity, enhance resilience of agro-systems, and reduce/remove greenhouse gases (GHGs) from agriculture production, and require planning to address tradeoffs and synergies between these three pillars: **productivity, adaptation, and mitigation** [1]. While the concept is new, and still evolving, many of the practices that constitute CSA already exist worldwide and are used by farmers to different degrees to cope with various production risks [2]. Mainstreaming CSA requires a critical stocktaking of existing and promising agricultural production practices for the future, and of institutional and financial enablers for CSA adoption. This country profile provides a snapshot of a developing baseline created to initiate the discussion about entry points for investing in and scaling up CSA in Sri Lanka.

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CGIAR Research Program on Climate Change, Agriculture and Food Security — CCAFS

CIAT

NRMC

FCRDI

Natural Resources Management Centre &
Field Crops Research and Development Institute
Department of Agriculture

Climate-Smart Agriculture Technologies and Practices in Sri Lanka

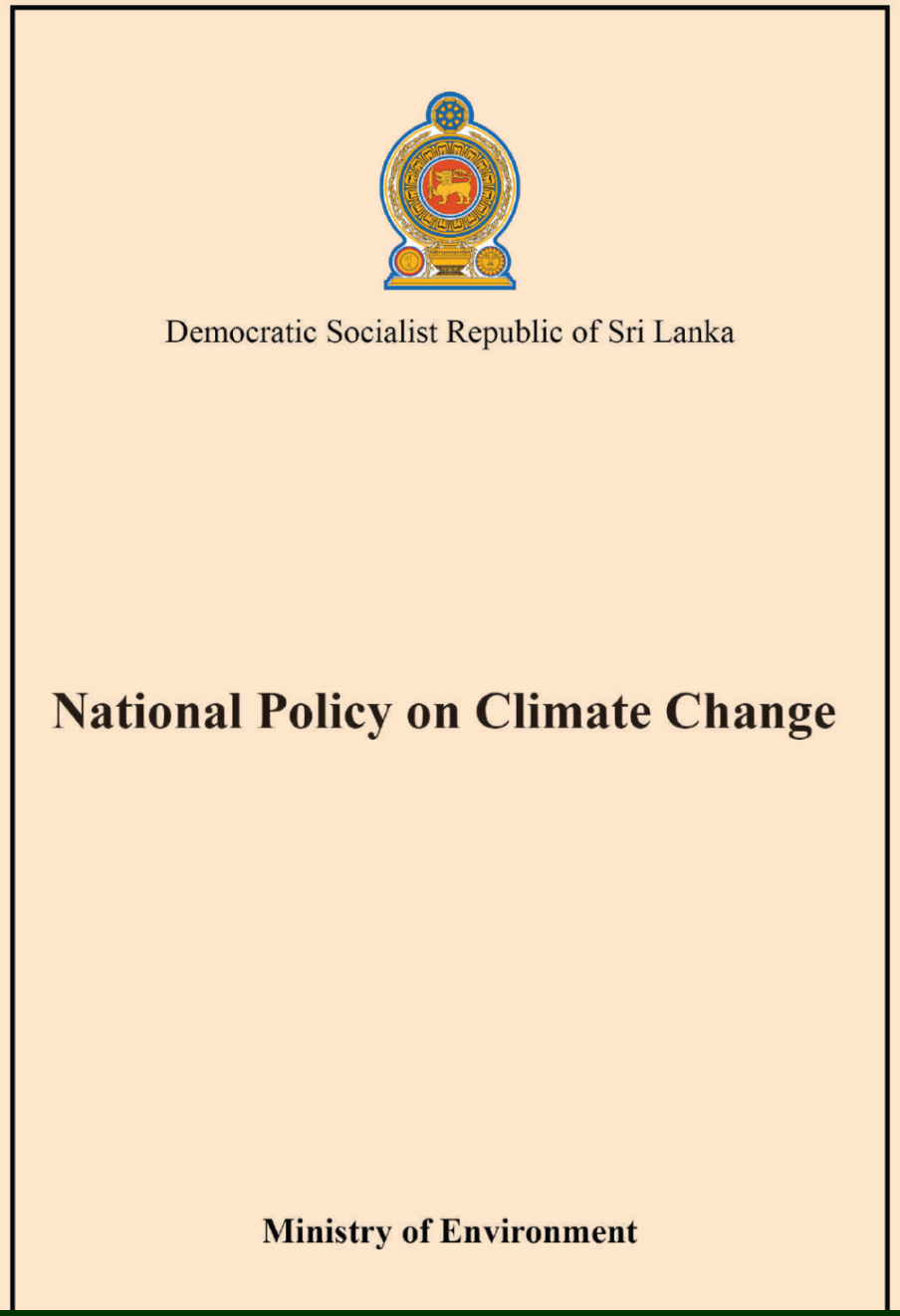
Consortium for Scaling-up Climate Smart Agriculture in South Asia (C-SUCSeS) Project
(IFAD Grant No. 2000001968)

SAARC Agriculture Centre
South Asian Association for Regional Cooperation (SAARC)

IFAD
Investing in rural people

SAARC Development Fund

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI



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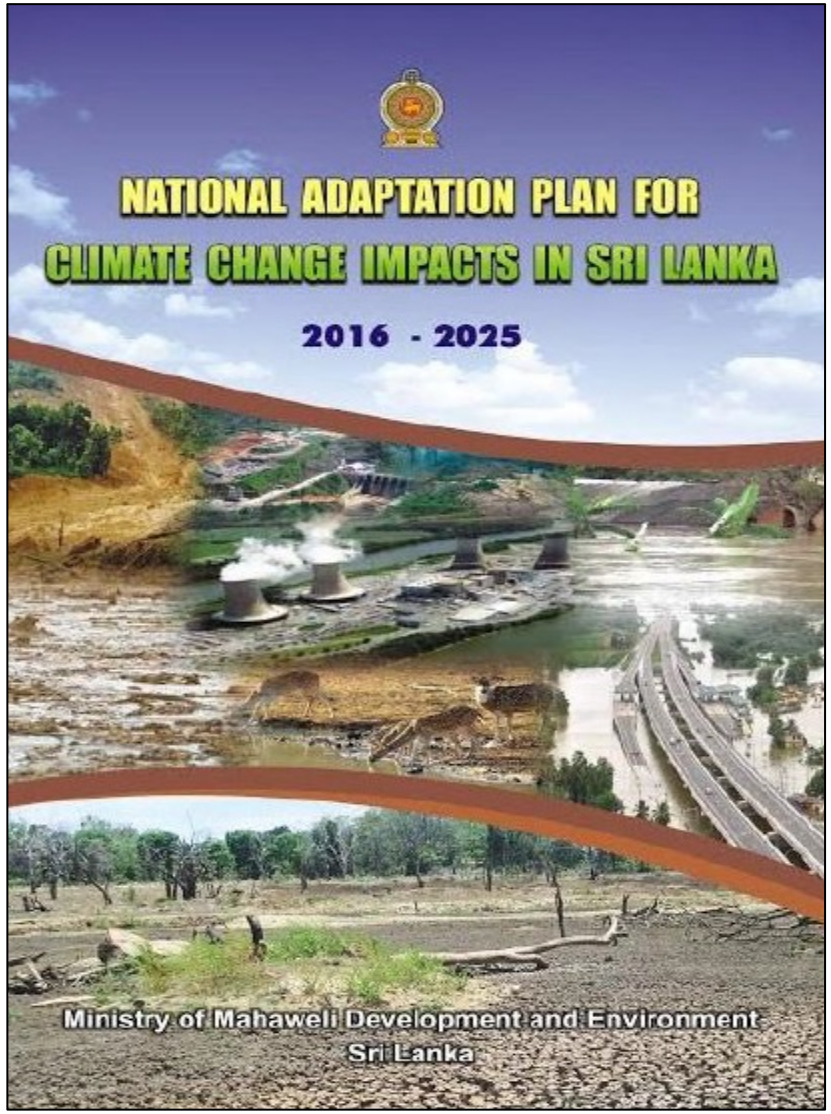
Updated National Policy on Climate Change (2023)

Building resilience - Adaptation



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CARBON NET ZERO 2050

ROADMAP AND STRATEGIC PLAN

SRI LANKA

US$ 140 billion

AUGUST 2023

MINISTRY OF ENVIRONMENT

Thank You