Assessment of Rainfall variability on Cereal Yield and Food Security in Australia.

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Problem Statement and Justification

To determine rainfall variability on cereal yield and food security in Australia.

Relevance

- Australian agriculture faced a prolonged and severe three consecutive years of drought (e.g. 2013- 2015, 2017-2019) (https://www.agriculture.gov.au/).
- This prolonged period of arid conditions has raised serious concerns about:
  - Sustainability, Resilience of the farming industry.

Societal Impact

- The lack of adequate rainfall over this extended period has led to devastating consequences, including:
  - Crop failures, Reduced livestock productivity, Water scarcity, Economic hardships for farmers and rural communities.

- Effective solutions must be devised to enhance drought preparedness (Rahman *et al*., 2022)[1]

[1] Yildirim, G., Rahman, A. Spatiotemporal meteorological drought assessment: a case study in south-east Australia. *Nat Hazards* 111, 305–332 (2022).

Project title

METHODOLOGY

DATA

❖ CHIRPS (Precipitation)
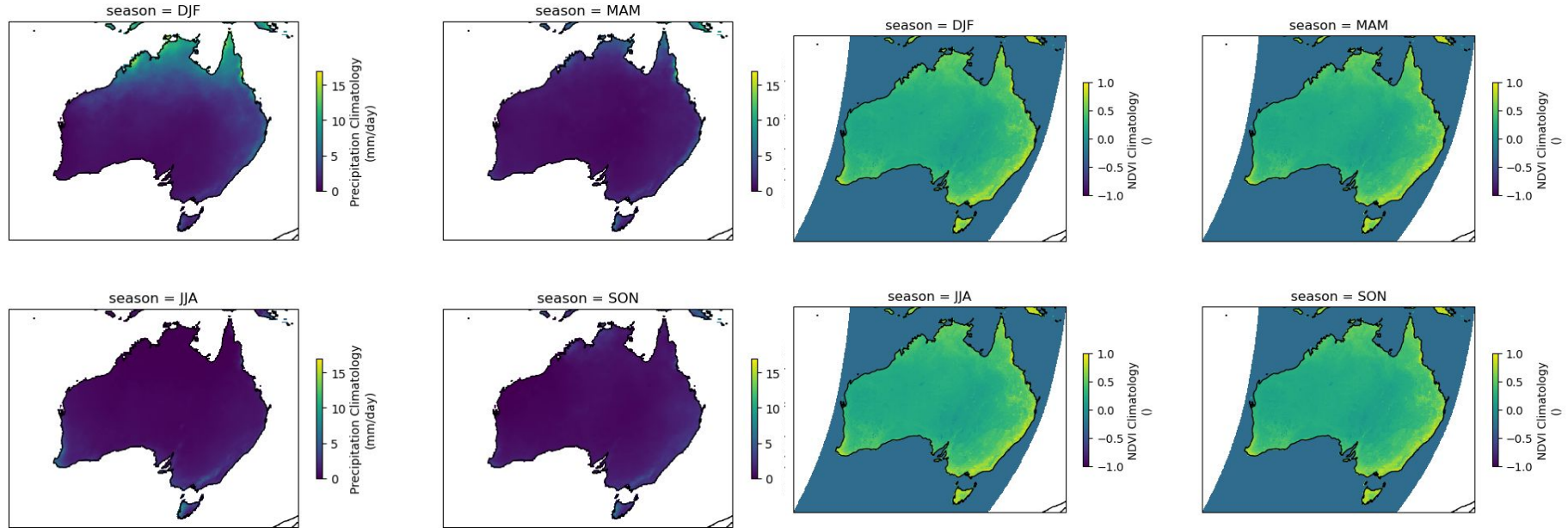
❖ MODIS (NDVI)

❖ WORLD BANK (Cereal Yield)

- ## ANALYSIS

- SDII Index (Simple Daily Intensity Index) is a measure of the average daily rainfall intensity for a specific period.

- CDD Index (Consecutive Dry Days) = Maximum number of consecutive dry days with precipitation <1 mm day^{-1}

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RESULTS AND DISCUSSION

- Figure 1 Shows the seasonal spatial rainfall distribution of and NDVI in Australia
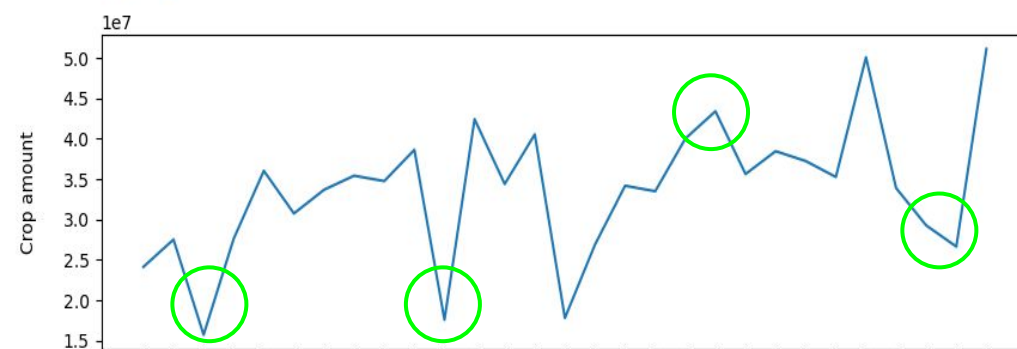
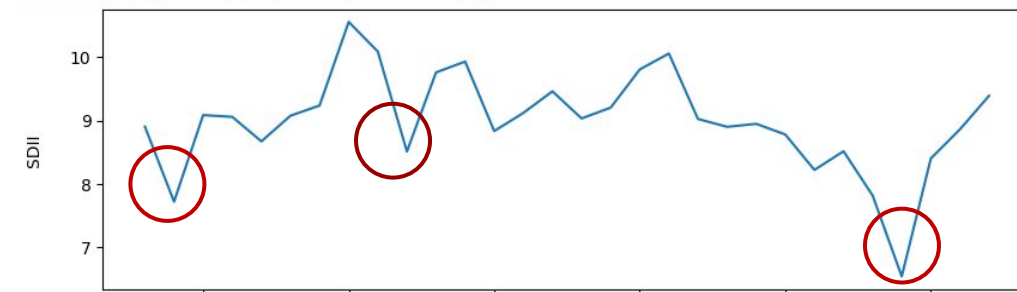Figure 2 shows cereal production.

Figure 3 shows SDII Index (Simple Daily Intensity Index). The average yearly rainfall intensity for 30 year period.
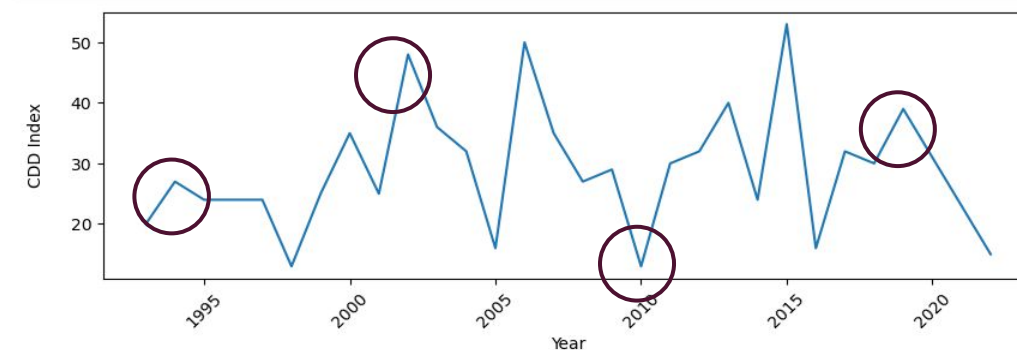
Figure 4 shows CDD Index (Consecutive Dry Days). Precipitation < 1 mm day^{-1} for 30 year period.

CONLUSIONS

- The analysis of crop production data reveals a clear pattern where;
  - Declines in crop production are closely associated with peaks in Consecutive Dry Days (CDD)
  - And troughs in Simple Daily Intensity Index (SDII).

Or vice-versa

Thank You