Navigating Climate Challenges in Global Agriculture

A Data Analysis by FARMWISE ANALYTICS

Meet the team

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Agenda

- Farmwise Analytics: Objective
- Climate Change events across the Globe
- Findings (Data Analytics, EDA, Metrics)
- Limitations in Data Analytics
- Strategic Insights

Farmwise Analytics: Empowering Agriculture with Data

- **Offer reliable data** on crop yield and weather patterns
- **Real-time data on crop yields** from 2010-present
- **Risk and Resilience assessment**
- **Enhancing sustainability through data-driven insights**

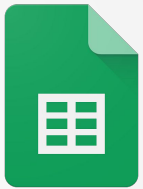
Climate Change events across the Globe

- Mexico drought 2011
- Germany flood 2021 Ahr valley

Data Analytics, EDA,Metrics

Technological tools

Data Analytics



Google Sheets

DBeaver

Data Visualization

Google Slides

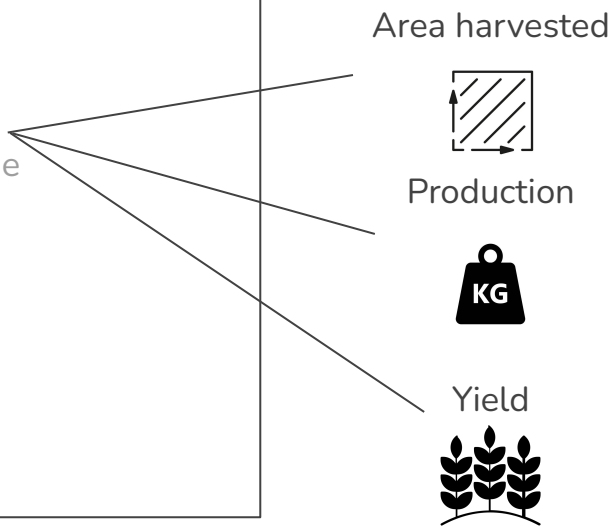
Insights from crops & weather data

Weather data

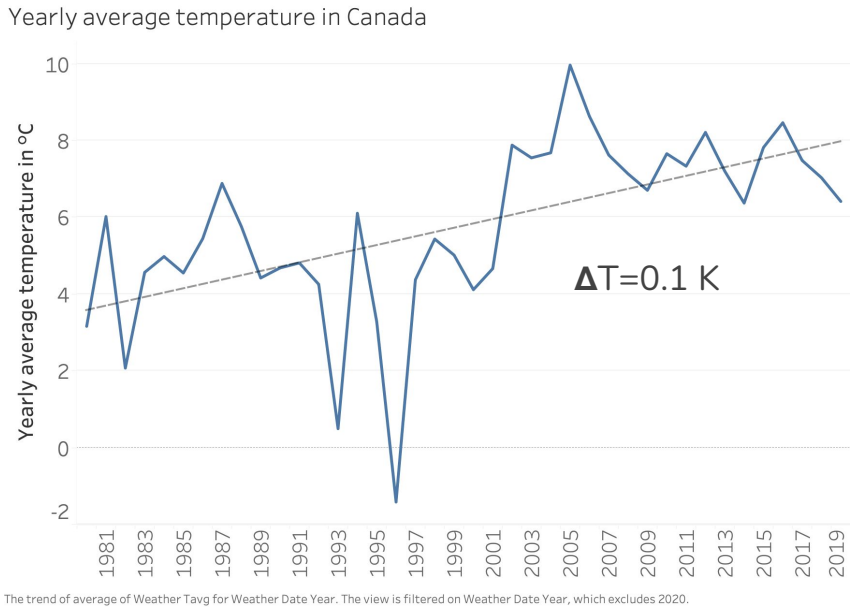
- Weather station
- Weather date
- Sunshine hours
- Precipitation
- Air pressure
- Snow
- Average Temperature
- Minimum Temperature
- Maximum Temperature
- Wind speed
- Wind direction

Crops data

- Area
- Area Code
- Element
- Element Code
- Flag
- Item
- Item Code
- Unit
- Year
- Year Code
- Value



Global Warming



- Long-term change
- Global temperature increase:
  - > 0.02 K/year (average)*
- ↑ frequency of heatwaves, droughts, floods

→ **heading towards the Global Warming**

*reference: NASA, https://climate.nasa.gov/what-is-climate-change/

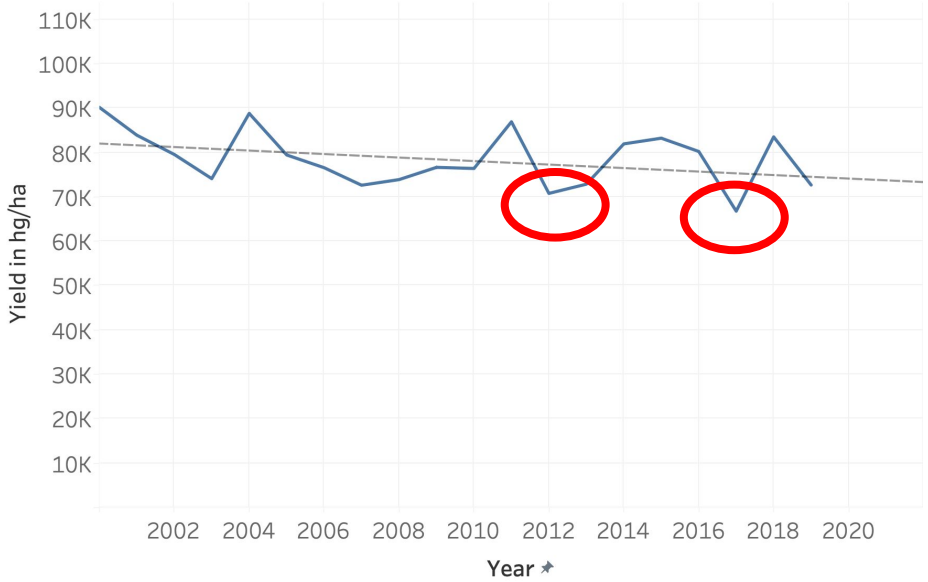
Global Warming

Country	Mean temperature change (hot month)
India	no change
Germany	0,04K/year
Mexico	no change
Switzerland	0,06K/year (high variation)
Ireland	no changes
Canada	0,12K/year
France	0.0001K/year (nearly constant))
China	0.04K/year
Ethiopia	0,06K/year
Malaysia	0.03K/year

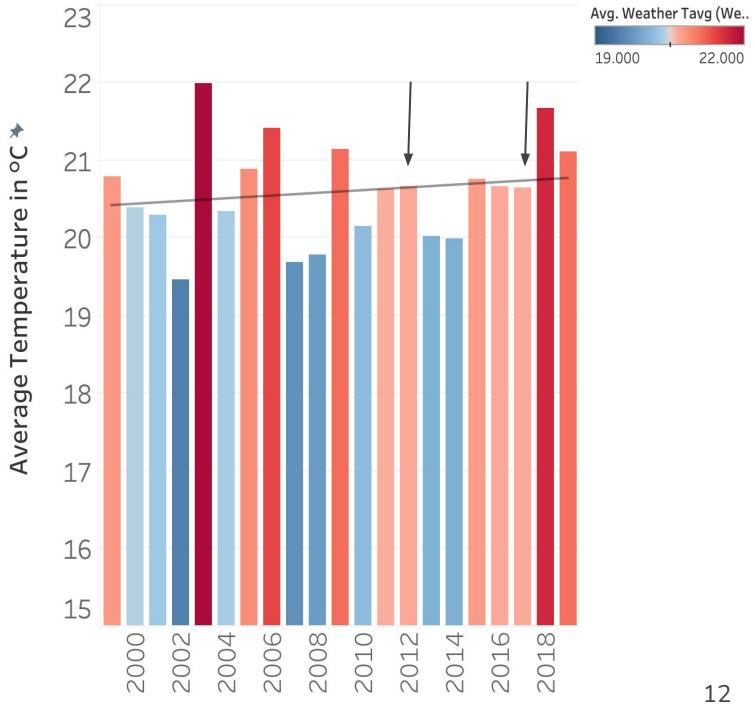
Findings: Examples of affect on crop yields by weather changes

France Frost: Grapes 2012 & 2017

Crop Yield of Grapes



France: Temperature in summer



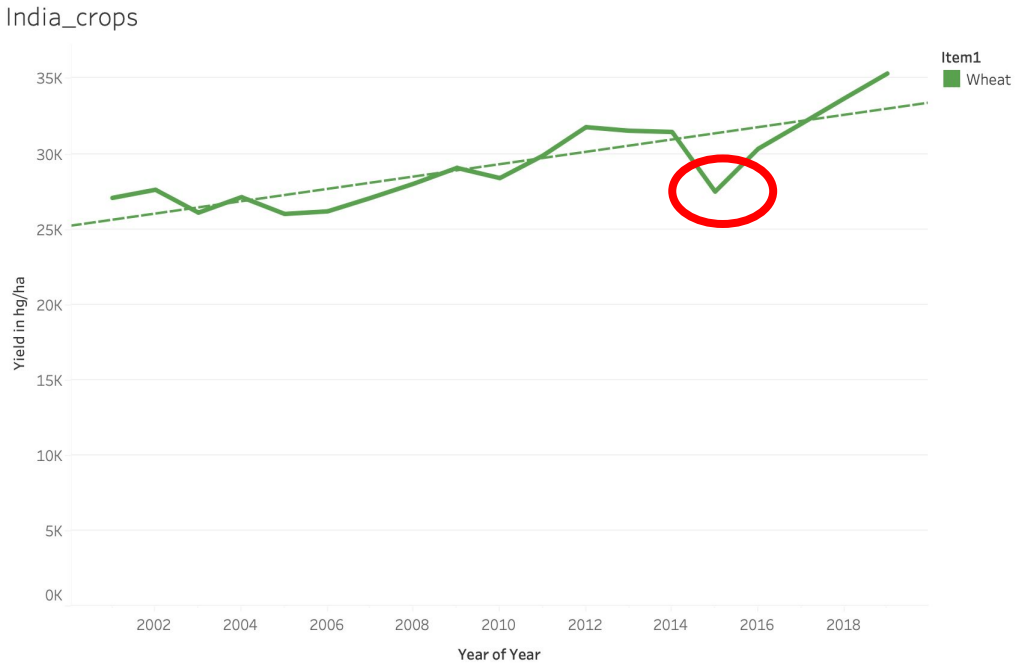
France Frost: Grapes 2012 & 2017

France: Average Temperature in March in °C

March 2005	March 2006	March 2007	March 2008	March 2009	March 2010	March 2011	March 2012	March 2013	March 2014	March 2015	March 2016	March 2017	March 2018	March 2019
9,3	10,3	10,6	10,2	10,8	9,1	10,9	12,0	9,6	11,0	10,8	9,9	12,3	10,1	11,9

- **April 2012 and 2017:**
  Minimum Temperature around zero (0.2 to 2.1°C) and even colder in the vineyards

India Heatwave and Flood: Wheat 2015

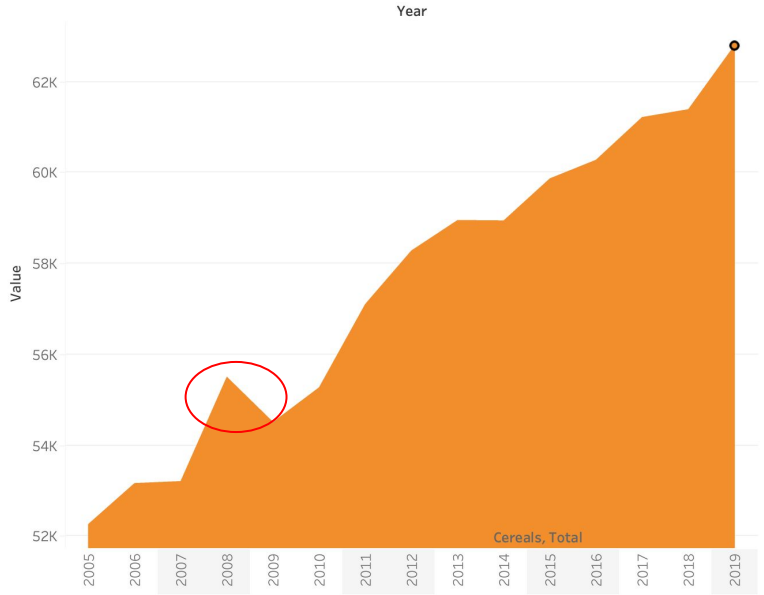


Weather Statistics in 2015

- Average Maximum Temperature in May-June 2015 = 43 °C
- Sum of Precipitation in November-December 2015 = 490 mm

More Crop per Drop: China's Cereal 2005-2019

Cereals yield/pA in China 2005-2019

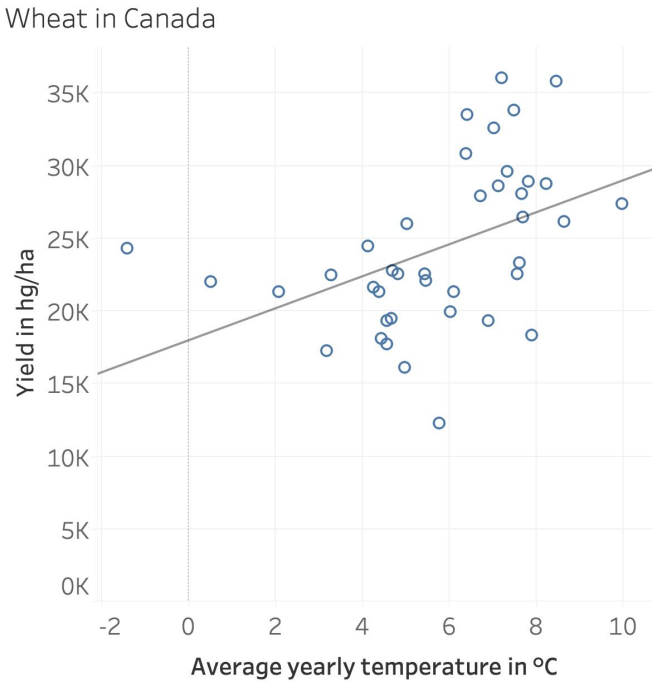


Precipitation China 2003 - 2019

	Weather Date							
	2003	2004	2005	2006	2007	2008	2009	2010
Weather Pr..	1,658	975	992	1,107	1,071	975	1,364	1,298
% of Weath..		59%	102%	112%	97%	91%	140%	95%
Avg. Weath..	16	17	16	17	17	16	16	16

Limitations in Data Analytics

- Lack of precipitation data before 2010
- Correlation between crop yield and weather data
- Average effects in large countries



Selected Strategic Insights

- **Climate Modeling** and preventive measures
- **Climate Data Integration** and irrigation needs
- **Precision Agriculture** and decision support, public awareness campaign

Thank you for your attention.

We look forward to questions and comments.