



UNIVERSITÀ
DEGLI STUDI
DI TRIESTE

«Geographical aspects of the coffee and commodities market in the face of climate change challenges»

Seminar by Maurizio Zugna

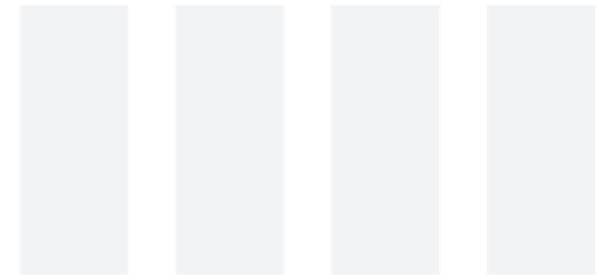
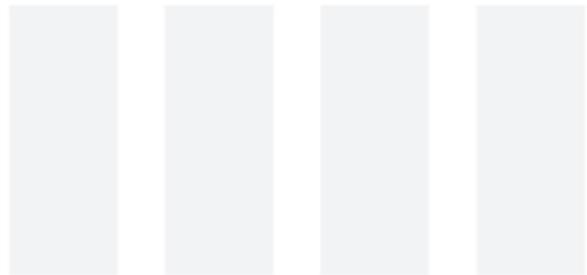
Geographical aspects of the coffee and commodities market in the face of climate change challenges

SEMINAR OVERVIEW

- Geographical dynamics of coffee and other soft commodities
- Climate change: temperature, rainfall, extreme events
- Macro events vs micro events
- Impacts on production, quality, and pricing
- Vulnerability, adaptation and policy responses

GEOGRAPHICAL DYNAMICS OF COFFEE AND OTHER SOFT COMMODITIES

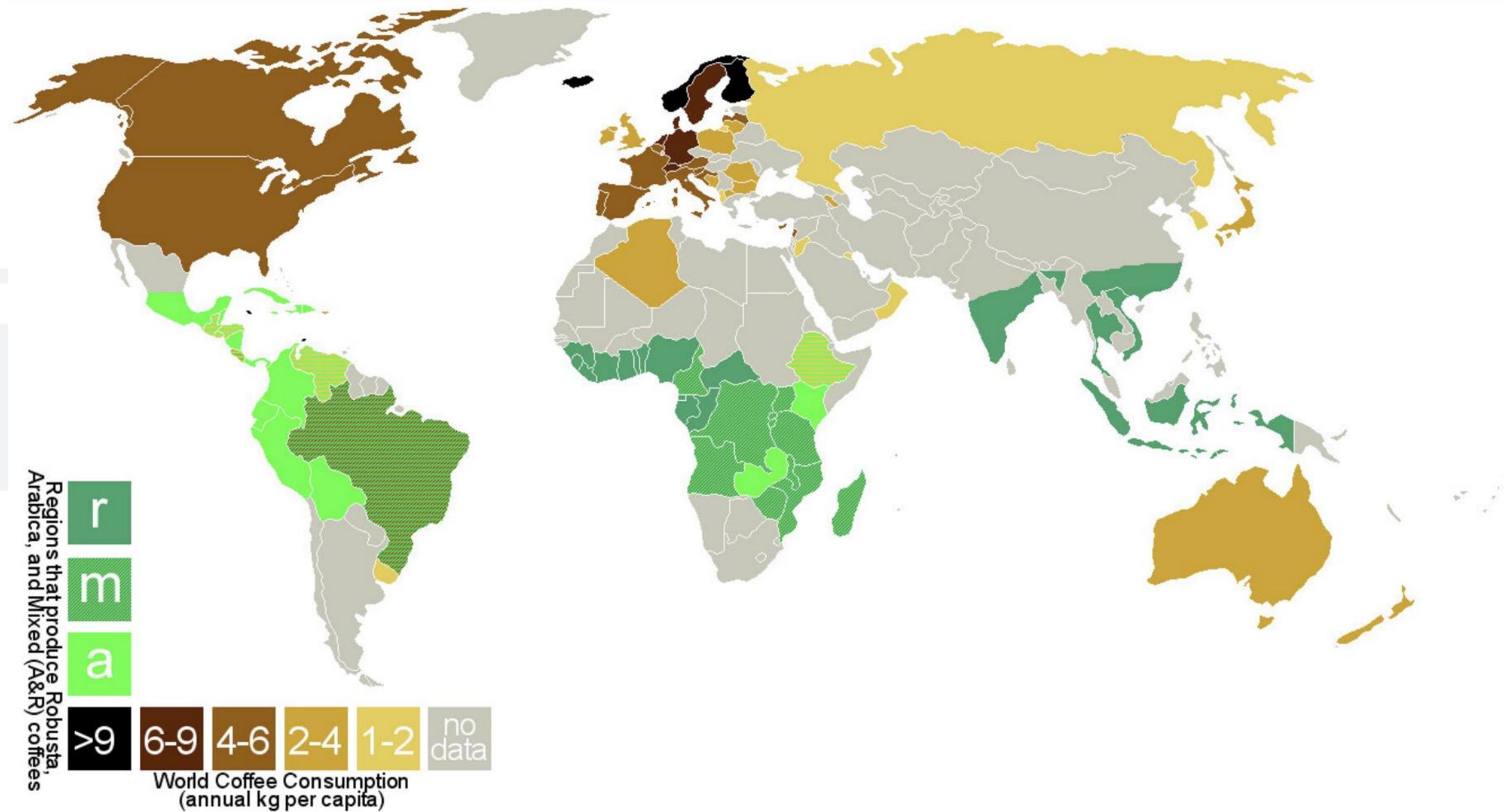
- Producing countries
- World relevance vs other commodities
- Physical vs exchange
- Volatility



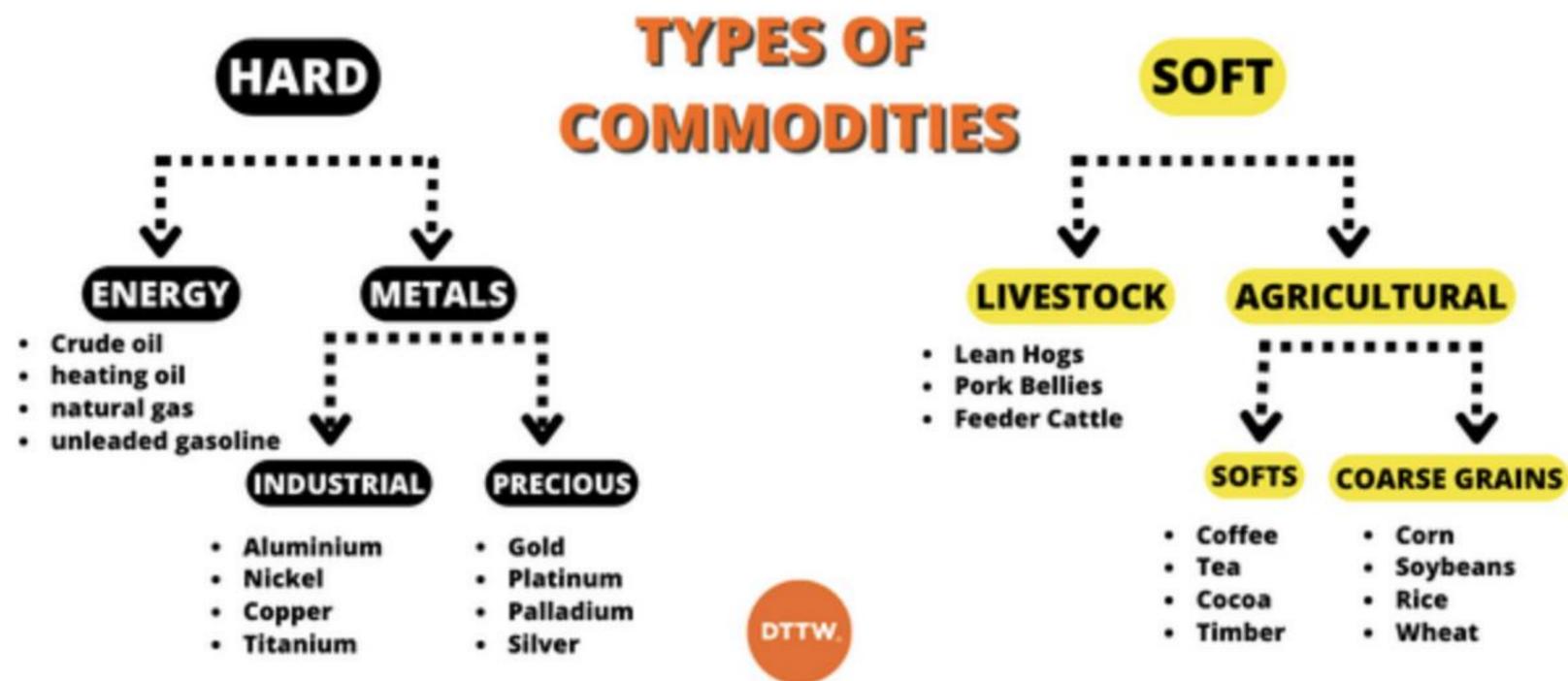
GEOGRAPHICAL DYNAMICS OF COFFEE AND OTHER SOFT COMMODITIES



GEOGRAPHICAL DYNAMICS OF COFFEE AND OTHER SOFT COMMODITIES



GEOGRAPHICAL DYNAMICS OF COFFEE AND OTHER SOFT COMMODITIES



Top 10 Most Traded Commodities in the World (2025)

1		1. Crude Oil	~88M barrels/day \$3.5T+ market
2		2. Coffee	~10M tons/year \$460B market
3		3. Natural Gas	~4,000+ bcm tradad \$1.2T market
4		4. Gold	~3,500 tons/year \$1.5T market
5		5. Wheat	~200M tons/year \$120B maret
6		6. Cotton	~25M tons/year \$50B market
7		7. Silver	~30,000 tons/year \$250B market
8		8. Copper	~22M tons/year \$200B market
9		9. Corn (Maize)	~180M tons/year \$80B market

GEOGRAPHICAL DYNAMICS OF COFFEE AND OTHER SOFT COMMODITIES

COFFEE C - ICE FUTURES U.S.
 FUTURES ONLY POSITIONS
 Code-083731

AS OF: 2025-09-23

[View Historical Data](#)

Non-Commercial			Commercial		Total		Non-Reportable	
Long	Short	Spreads	Long	Short	Long	Short	Long	Short
(CONTRACTS OF 37,500 POUNDS)						Open Interest: 169,676		
61,385	24,677	35,998	63,621	103,282	161,004	163,957	8,672	5,719
Changes						(Change In Open Interest: -6,329)		
-1,678	+1,790	-1,676	-2,068	-5,992	-5,422	-5,878	-907	-451
Percent of Open Interest for Each Category of Traders								
36.2%	14.5%	21.2%	37.5%	60.9%	94.9%	96.6%	5.1%	3.4%
Number of Traders in Each Category						(Total Traders: 341)		
128	69	99	99	113	270	249		

GEOGRAPHICAL DYNAMICS OF COFFEE AND OTHER SOFT COMMODITIES

COFFEE C - ICE FUTURES U.S.
FUTURES ONLY POSITIONS
Code-083731

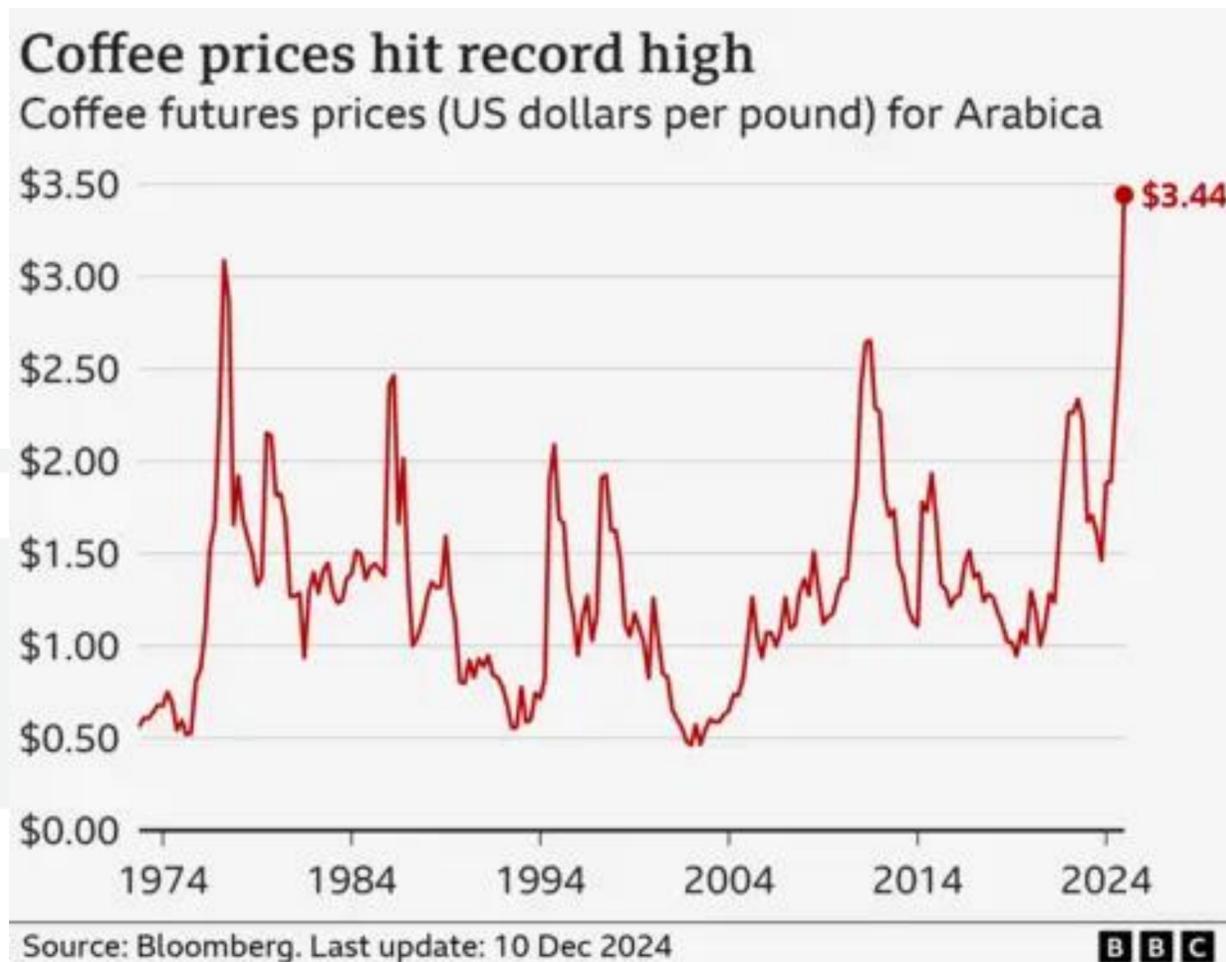
AS OF: 2025-09-23

[View Historical Data](#)

Non-Commercial			Commercial		Total		Non-Reportable	
Long	Short	Spreads	Long	Short	Long	Short	Long	Short
(CONTRACTS OF 37,500 POUNDS)						Open Interest: 169,676		
61,385	24,677	35,998	63,621	103,282	161,004	163,957	8,672	5,719
Changes						(Change In Open Interest: -6,329)		
-1,678	+1,790	-1,676	-2,068	-5,992	-5,422	-5,878	-907	-451
Percent of Open Interest for Each Category of Traders								
36.2%	14.5%	21.2%	37.5%	60.9%	94.9%	96.6%	5.1%	3.4%
Number of Traders in Each Category						(Total Traders: 341)		
128	69	99	99	113	270	249		

$161.004 * 283,5 = 45 \text{ mil bags}$
total world production = 170 mil bags

GEOGRAPHICAL DYNAMICS OF COFFEE AND OTHER SOFT COMMODITIES



CLIMATE CHANGE: TEMPERATURE, RAINFALL, EXTREME EVENTS

- Shifting temperature and precipitation patterns
- Increased frequency of droughts and frosts
- Regional differentiation: Brazil, Ethiopia, Vietnam
- Declining yields and rising volatility

CLIMATE CHANGE: TEMPERATURE, RAINFALL, EXTREME EVENTS

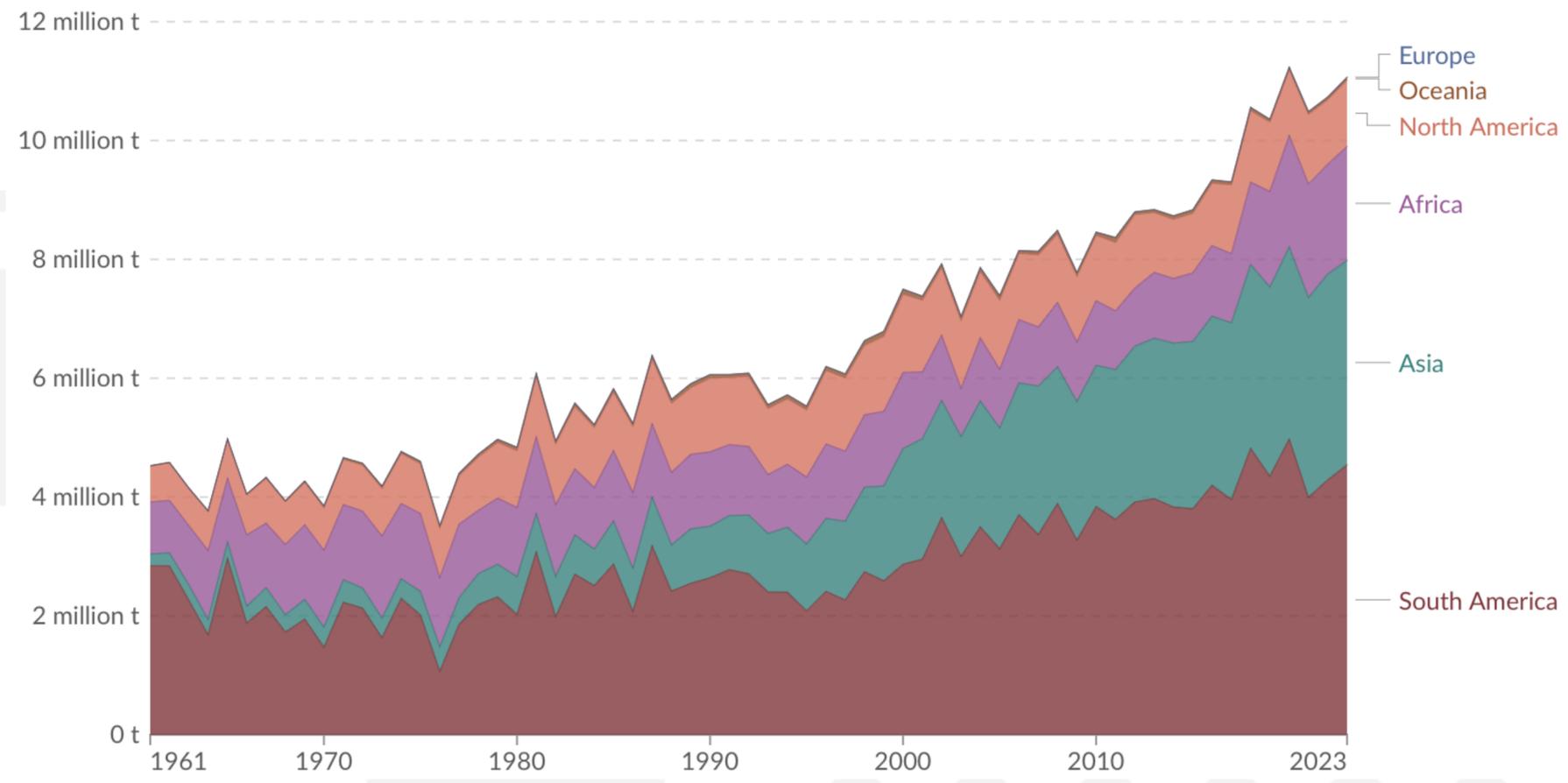
Coffee production by region, 1961 to 2023

Green coffee beans are coffee seeds (beans) that have not yet been roasted.

Our World
in Data

Table Chart

Settings



CLIMATE CHANGE: TEMPERATURE, RAINFALL, EXTREME EVENTS

Between 2020 and 2024, shifting temperature and precipitation patterns negatively impacted coffee production due to increased droughts, floods, and temperature extremes. These climate anomalies led to reduced harvests in major producing countries like Brazil and Vietnam, contributing to higher global coffee prices. Changing weather patterns also made coffee plants more vulnerable to pests and diseases like coffee leaf rust, which spread more easily in warm and humid conditions.



CLIMATE CHANGE: TEMPERATURE, RAINFALL, EXTREME EVENTS

Key impacts on coffee production (2020-2024)

Brazil:

Experienced severe droughts and frosts, which significantly damaged crops and led to lower yields.

Vietnam:

Suffered from drought, causing a more than 10% decrease in coffee production in 2023 compared to the previous year.

Ethiopia:

Experienced erratic rainfall and prolonged droughts, causing fluctuating yields in different growing regions.

Pests and diseases:

Warmer temperatures and increased humidity favored the spread of pests and diseases, such as coffee leaf rust, which are now a major threat.

Reduced suitable land:

Scientists have warned that climate change could reduce the amount of land suitable for coffee growing by up to 50% by mid-century.

Supply chain disruption:

The combination of these factors created supply constraints and drove up global coffee prices.

CLIMATE CHANGE: TEMPERATURE, RAINFALL, EXTREME EVENTS

Contributing factors

Rising temperatures:

Higher temperatures can accelerate the ripening process of coffee cherries, leading to lower yields and quality.

Erratic rainfall:

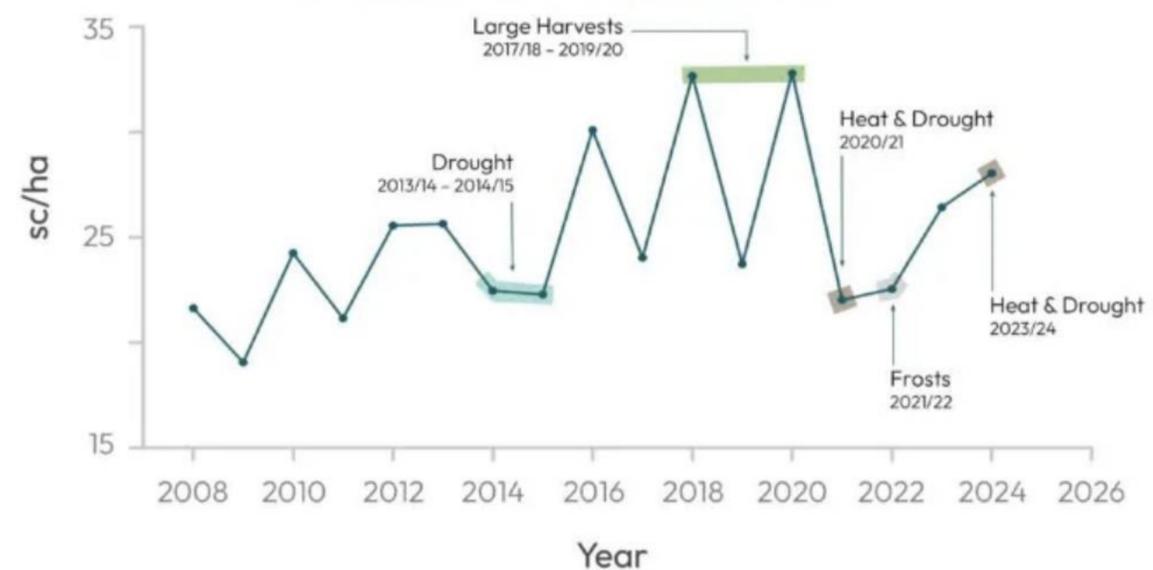
Both excessive rainfall and prolonged droughts disrupt the natural cycles coffee plants need to thrive. Consistent rainfall is ideal, but the timing and amount have become unpredictable.

Extreme weather events:

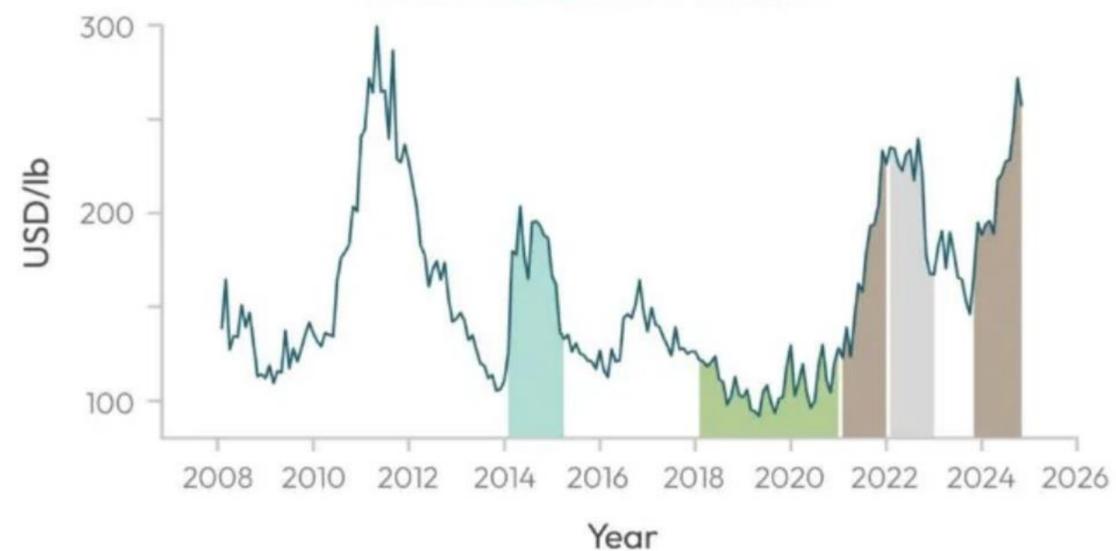
Climate change is increasing the frequency and intensity of extreme events like frosts and severe droughts, which can devastate crops in a short period.

CLIMATE CHANGE: TEMPERATURE, RAINFALL, EXTREME EVENTS

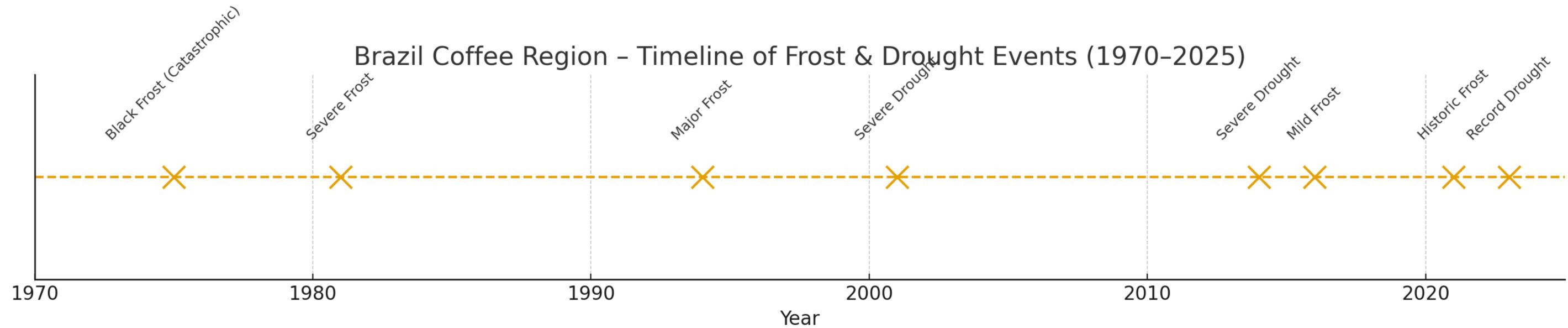
Arabica Coffee Yield, Brazil



Arabica Coffee Price



CLIMATE CHANGE: TEMPERATURE, RAINFALL, EXTREME EVENTS

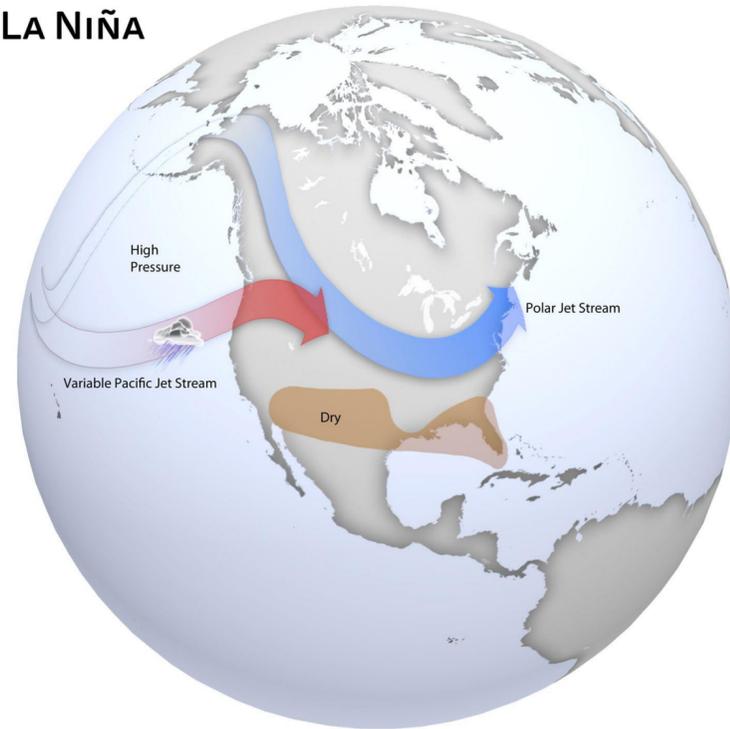


MARCO EVENTS VS MICRO EVENTS

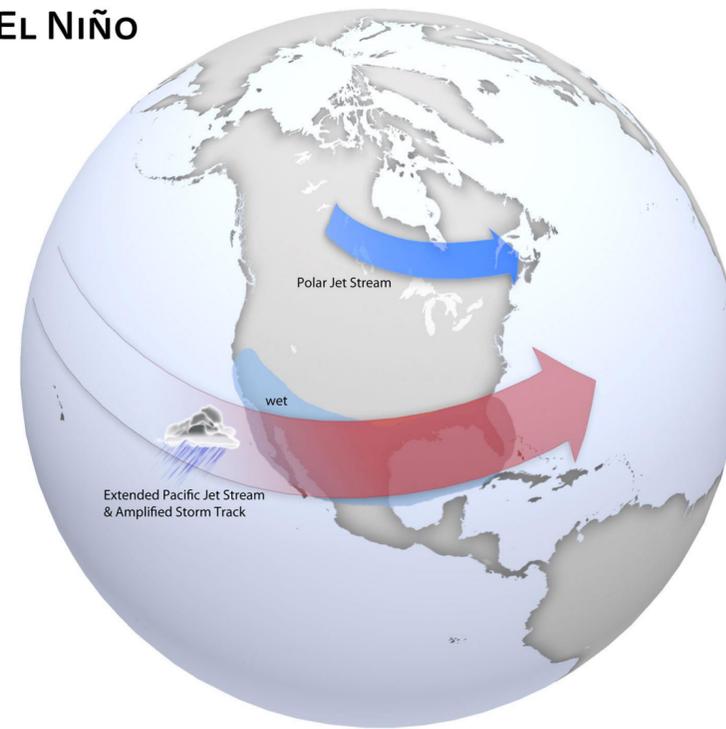
- El Nino & La Nina
- Frost and draught in Brazil
- Floods in CentAm
- Hurricane in Vietnam

MARCO EVENTS VS MICRO EVENTS

LA NIÑA

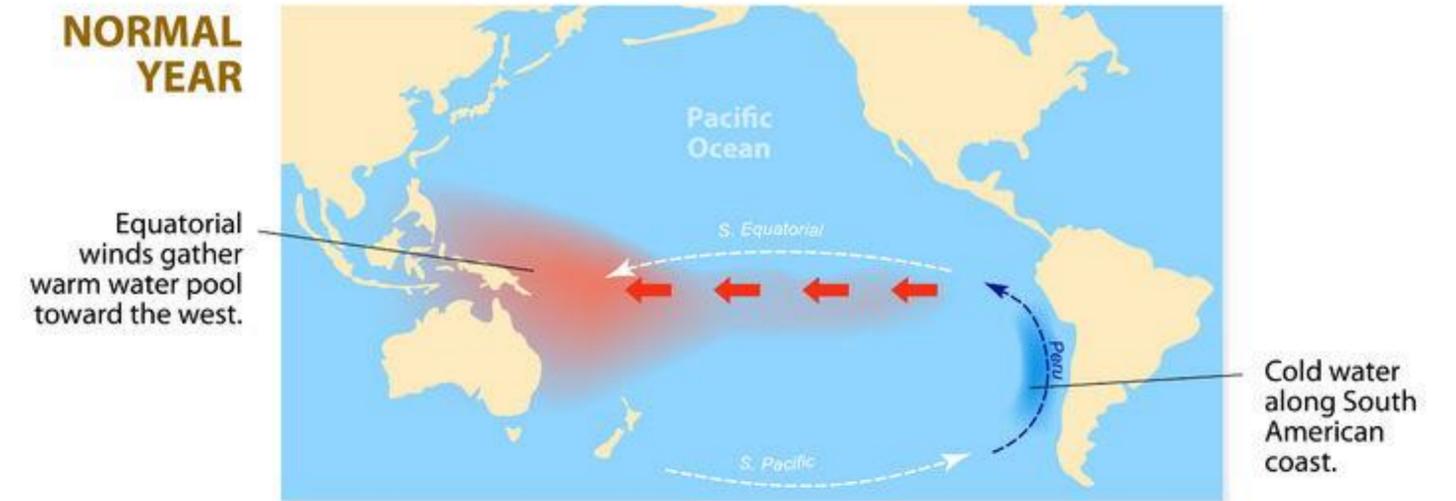


EL NIÑO

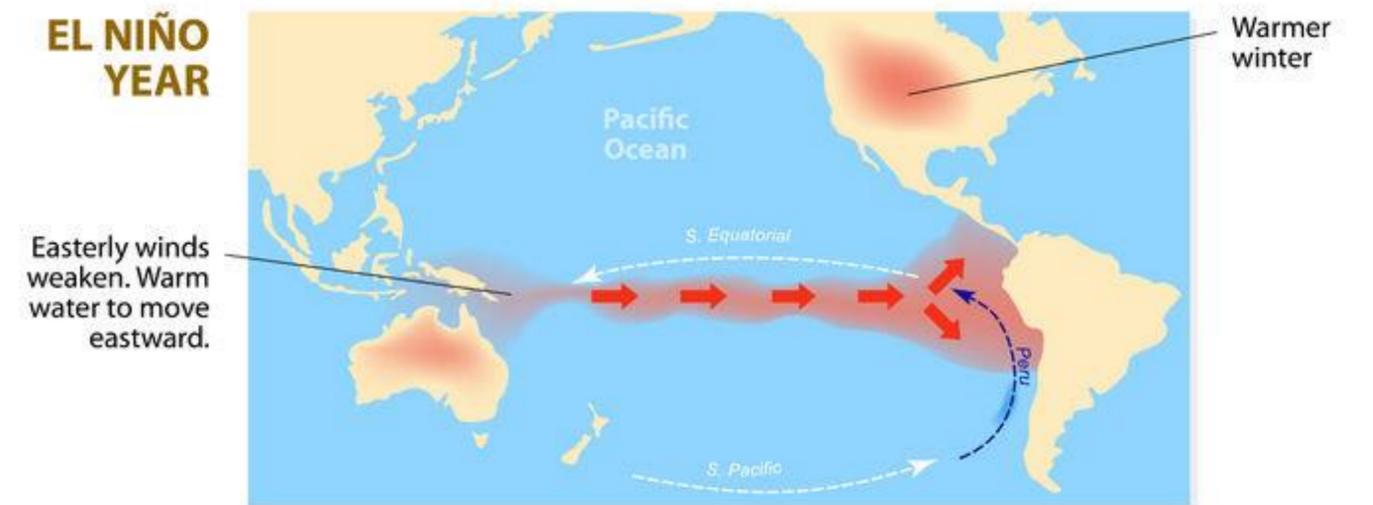


THE EL NIÑO PHENOMENON

NORMAL YEAR



EL NIÑO YEAR



MARCO EVENTS VS MICRO EVENTS

El Niño and La Niña are opposite phases of El Niño-Southern Oscillation (ENSO), a climate pattern in the tropical Pacific Ocean that affects global weather. El Niño is the "warm phase," characterized by warmer-than-average sea surface temperatures and weaker trade winds, which often leads to increased rainfall in the central and eastern Pacific. La Niña is the "cool phase," with cooler-than-average sea surface temperatures and stronger trade winds, leading to more rainfall in the western Pacific and less in the eastern Pacific.

MARCO EVENTS VS MICRO EVENTS

- **Brazil's droughts** have led to reduced coffee harvests, higher global coffee prices, and lower quality beans. These effects result from damage to coffee plants, which decreases crop yields and leads to lower stockpiles, causing the price of green coffee beans to rise significantly. Consequently, this affects consumers through higher prices and may force businesses to seek cheaper alternatives or innovate.

MARCO EVENTS VS MICRO EVENTS

- **Floods, hurricanes, and other natural disasters severely impact Central American coffee production** by destroying farms, causing landslides, eroding soil, and damaging infrastructure. Heavy rainfall can wash away fertile soil on steep slopes ideal for coffee cultivation, and storms can lead to crop loss and significant economic damage, affecting both large-scale production and smallholder farmers who often lack the resources to recover.
-
-

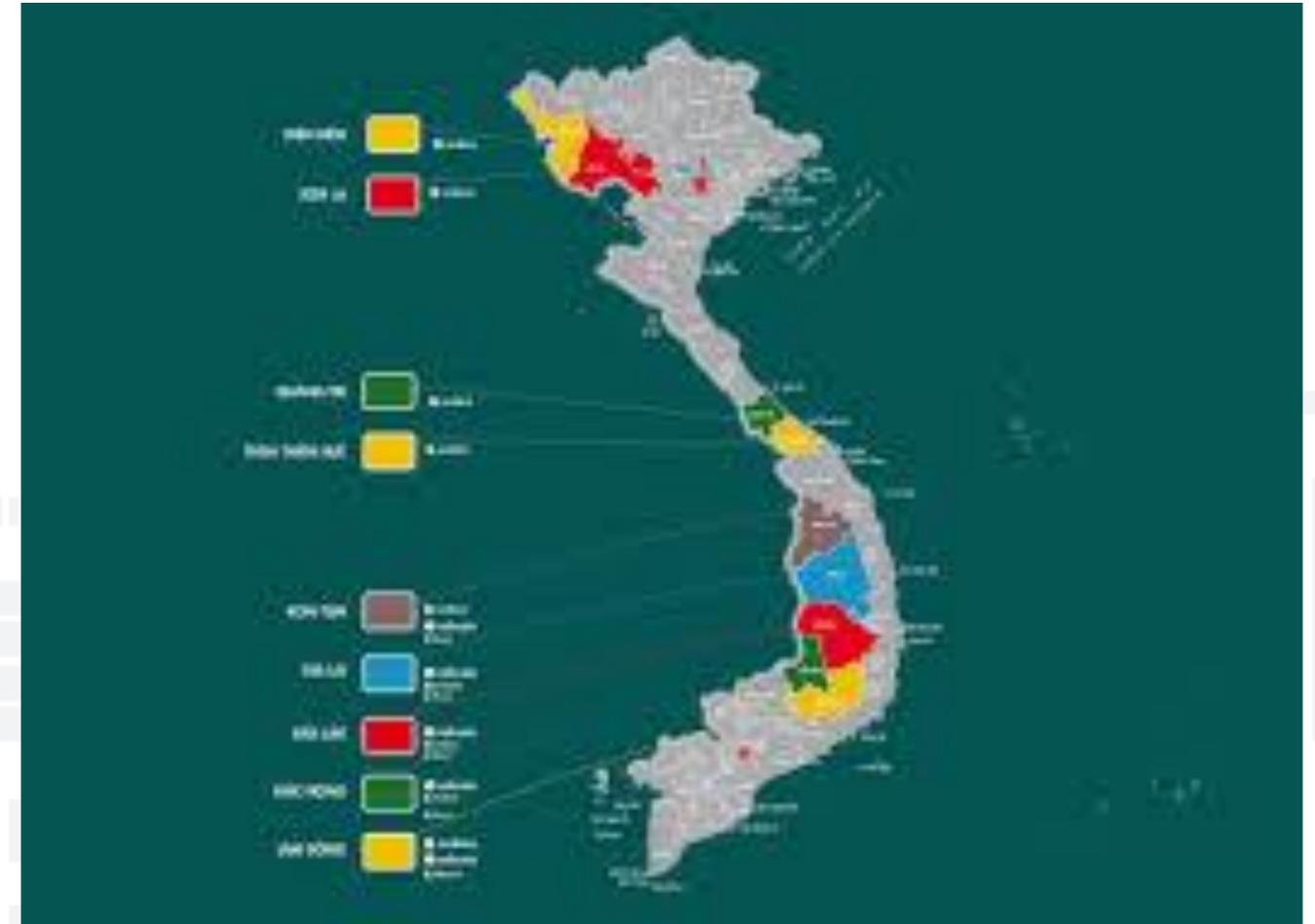


MARCO EVENTS VS MICRO EVENTS

· **Typhoons in Vietnam's** coffee-growing regions can lead to increased coffee prices due to potential crop damage, delayed harvests, and reduced supply. While some storms may only cause minor issues like fallen cherries, heavy rains can affect quality and disrupt the harvest schedule. These impacts, compounded by other climate challenges like drought, create instability in the global coffee market, especially for robusta.

·

·



VULNERABILITY, ADAPTATION AND POLICY RESPONSES

- Shade-grown, agroforestry, resistant varieties
- EU EUDR, CSRD, carbon-credit markets
- Insurance, traceability, resilience planning
- Consumer-driven sustainability transformation