



Global Trade Analysis Project



Agricultural Economics  
College of Agriculture

# Economic and Agricultural Impacts of the Russian Invasion of Ukraine

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*Based on the joint work with*

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Purdue Farm Policy Study Group

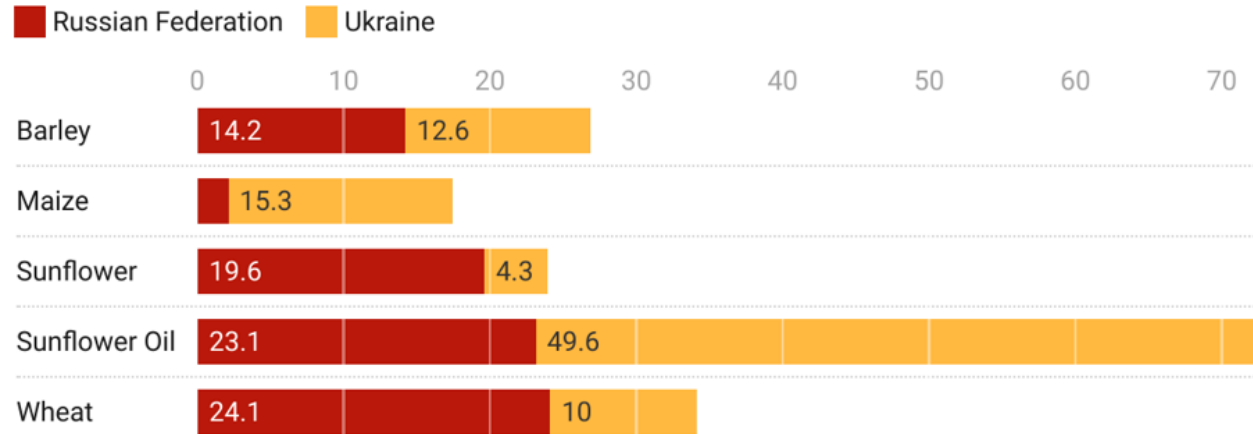
12 July, 2022

# Outline

- **The importance of Black Sea region and mounting price pressure**
- **The War in Ukraine is disrupting commodity markets**
  - There are winners and losers
- **The impact of war is exacerbated in many other ways**
  - Adverse weather events
  - Energy sanctions on Russia
- **Conclusion**

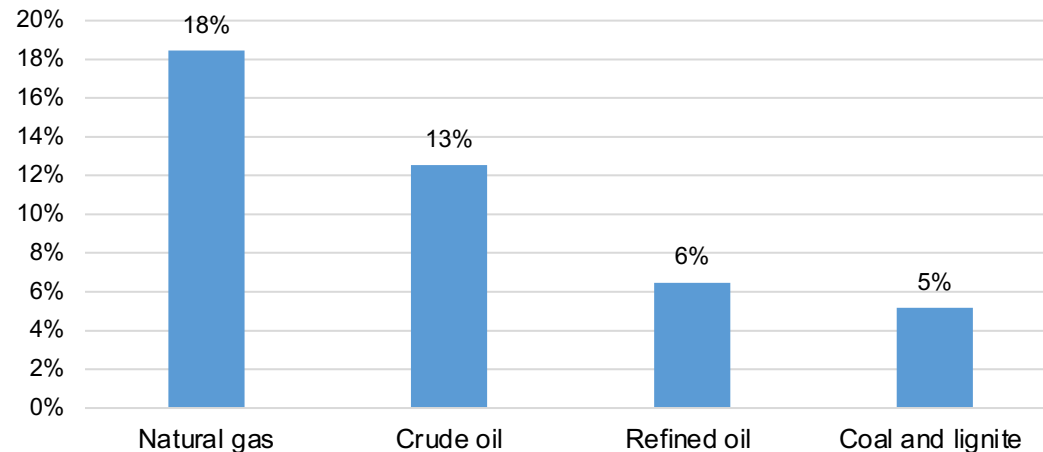
# The Black Sea region is an important commodity supplier

## Ukraine's and Russia's share of global trade, 2018-2020



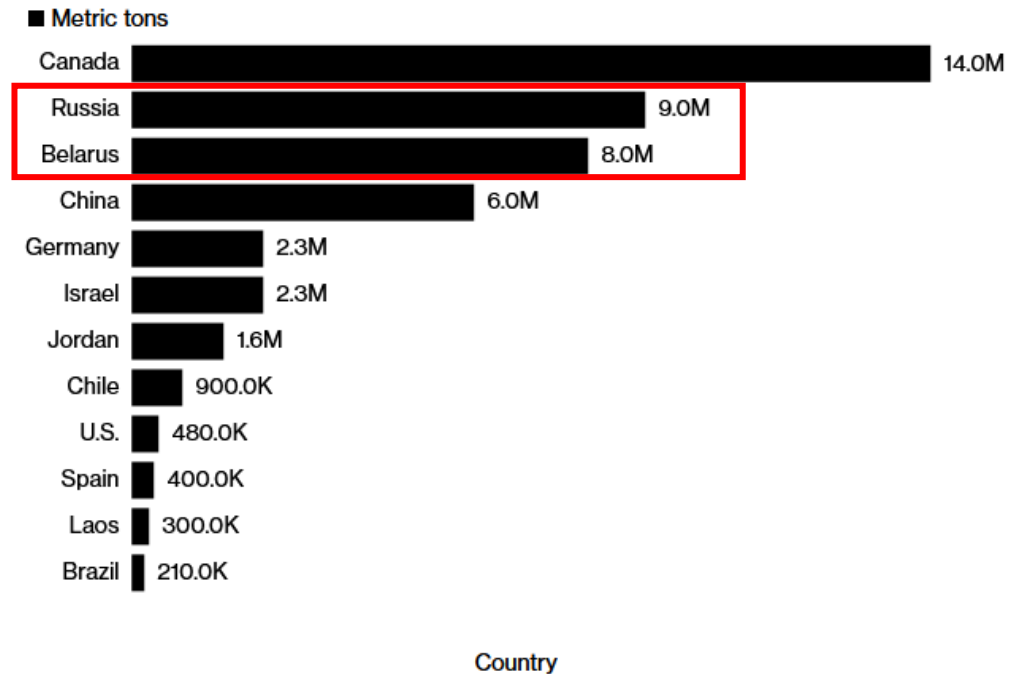
Source: Glauber and Laborde (2022)

## Russia's share in global fuel production (2017)



Source: based on <https://energydata.info/>

## Top potash fertilizer producers in 2021



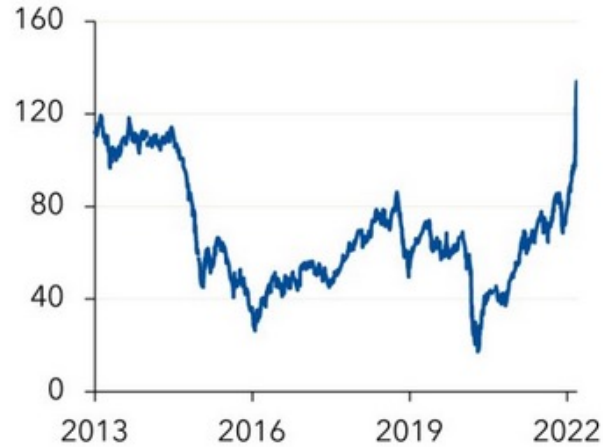
Source: USGS 2022 Mineral Commodity Summary  
Note: Volumes are USGS estimates.

Source: Bloomberg (2022)

# Price pressure has been mounting long before the war

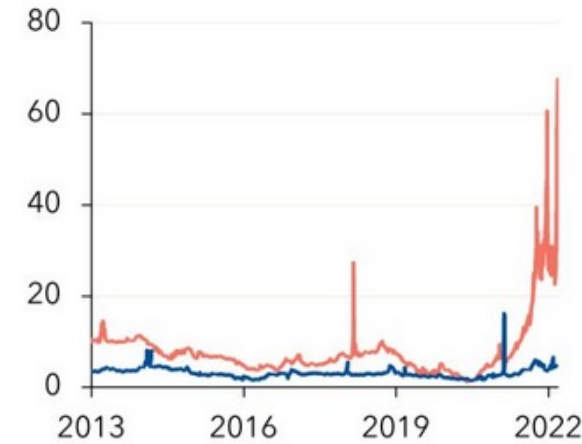
### Brent Crude Oil

(\$US/barrel)



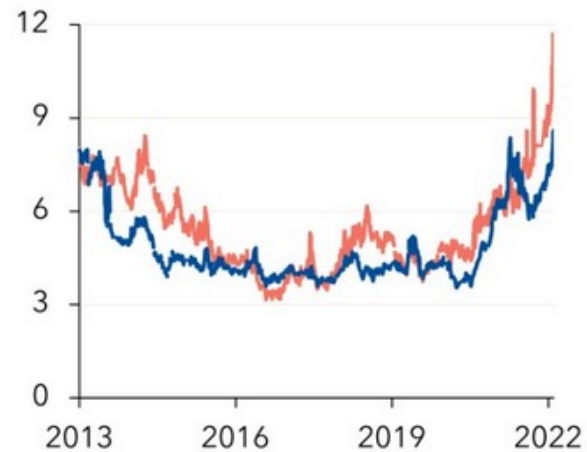
### European & US Natural Gas\*

(\$US/MMBtu)



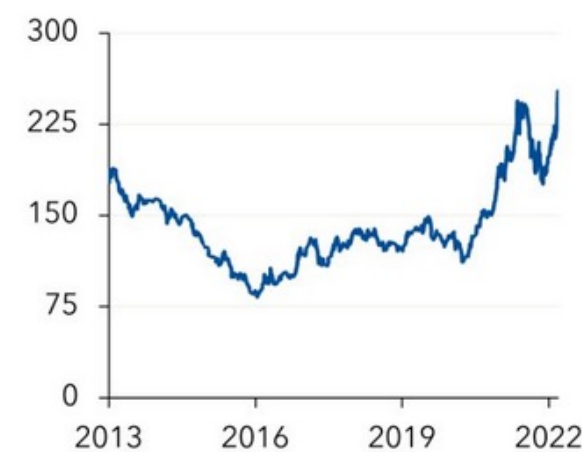
### Corn, Wheat

(\$US/bushel)



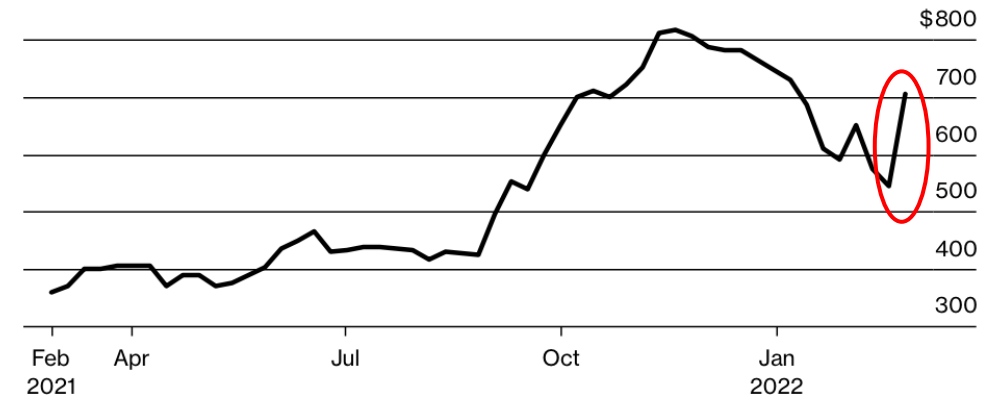
### Metals Index\*\*

(2016=100)



### New Orleans Urea

Price per short ton



Source: Green Markets, Bloomberg

“Soaring Fertilizer Prices Are About to Increase the Cost of Food,” by Elizabeth Elkin. Bloomberg News (March 1, 2022).

Source: Kammer et al. (2022)

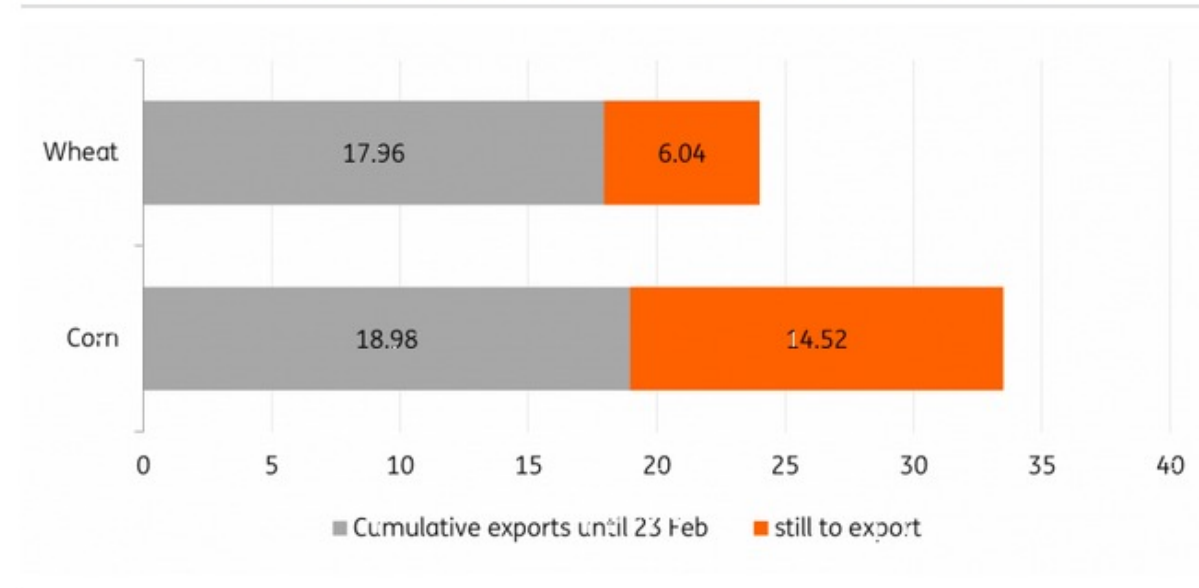
# War is further disrupting commodity markets

- **Russia's invasion of Ukraine has adversely impacted global agricultural, energy and fertilizer markets:**
  - Immediate supply disruptions (corn and wheat shipping in Ukraine are blocked).
  - Limited opportunities to export grain from Ukraine via rail and road transportation routes.
  - Drastic short/mid-term price increases with a potential to sustain in the long-run.
  
- **Severe sanctions imposed on Russia and Belarus -> reputational risks for businesses:**
  - EU has blocked imports of potash from Belarus
  - Import energy bans (US, UK, EU). Expected to further strengthened within the next package of sanctions.
  - Russia is implementing restrictions on exports of selected commodities, including grains and sugar.
  - Other countries are restricting food exports to ensure domestic food security.

# Implications for agricultural supply in the Black Sea region

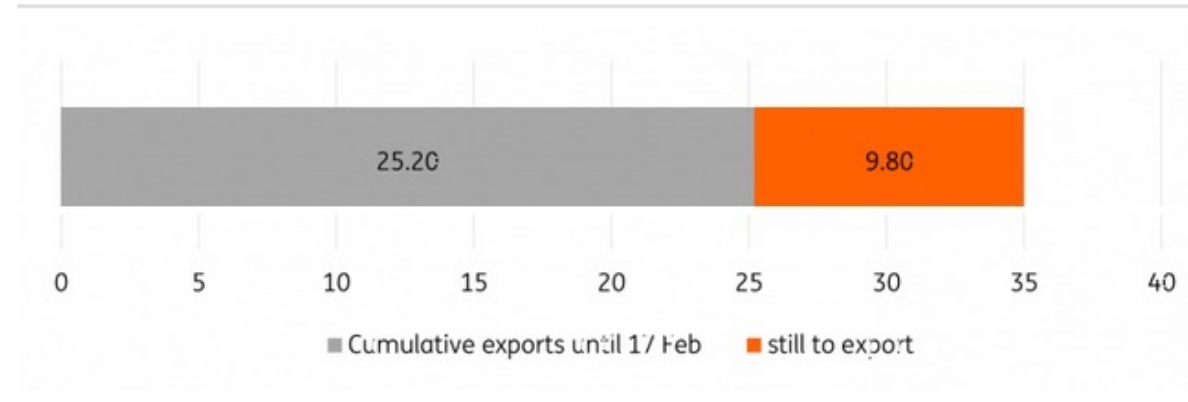
**Expected  
VS  
Actual  
exports of wheat and corn  
from Ukraine in 2021/2022**

Ukraine still has a sizeable amount of grains from 2021/22 to export (m tonnes)



**Expected  
VS  
Actual  
exports of wheat from  
Russia in 2021/2022**

Self-sanctioning of Russian commodities likely to slow pace of 2021/22 wheat exports (m tonnes)



Source: Patterson (2022)

# Why grain can't get out of Ukraine?

- **About 20m tons of grain are in storage, as the new harvest begins**
  - Ukraine has exported most of its 2020/2021 crop before Russian invasion.
  - Ukrainian ports on the Black Sea are under blockade (the area is heavily mined).
  - Limited storage for the new harvest.
- **Infrastructural challenges to export**
  - Road and rail routes limit export opportunities (20% of capacity).
  - Railway gauge in Ukraine is 4 inches wider than in the EU.
  - Ukrainian infrastructure is partially damaged.
  - Negotiations on deblocking Black Sea routes for grain export are stalled (+ demining challenge).





# What is the impact of war on global economy and agriculture?



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## Agricultural and energy importers in the developing world are hit hardest by the Ukraine war's economic fallout

Maksym Chepeliev, Maryla Maliszewska, Maria Filipa Seara e Pereira 08 May 2022

The Russian invasion of Ukraine is disrupting global supplies of essential commodities, pushing prices higher, slowing trade, and driving down incomes. This column argues that developing countries that are large agricultural and energy importers are being hit hardest. While some commodity exporters might be able to step up exports to benefit from increasing global prices, they could experience a restructuring of their trade patterns, resulting in a lower integration into global value chains. Consumers across the world are worse off, with the poorest being impacted the most adversely.

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Ethan Artuc, Guillermo Falcone, Guido Porto, Bob Rijkers
- Russia's war against Ukraine might persistently shift global supply chains  
Tobias Kom, Henry Stemmler

**Figure 1** Russia and Ukraine's global shares of key commodity exports in 2019 (%)

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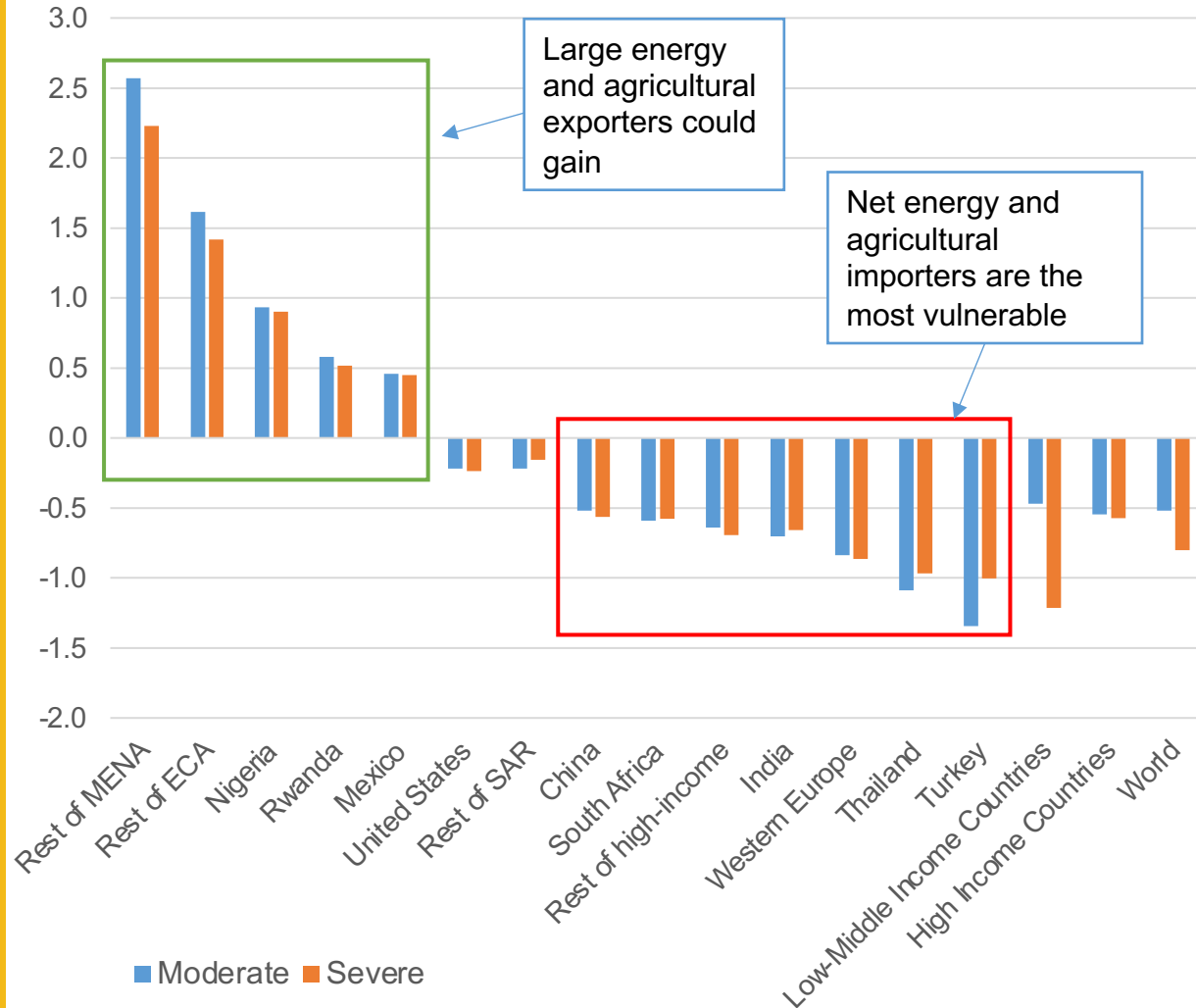
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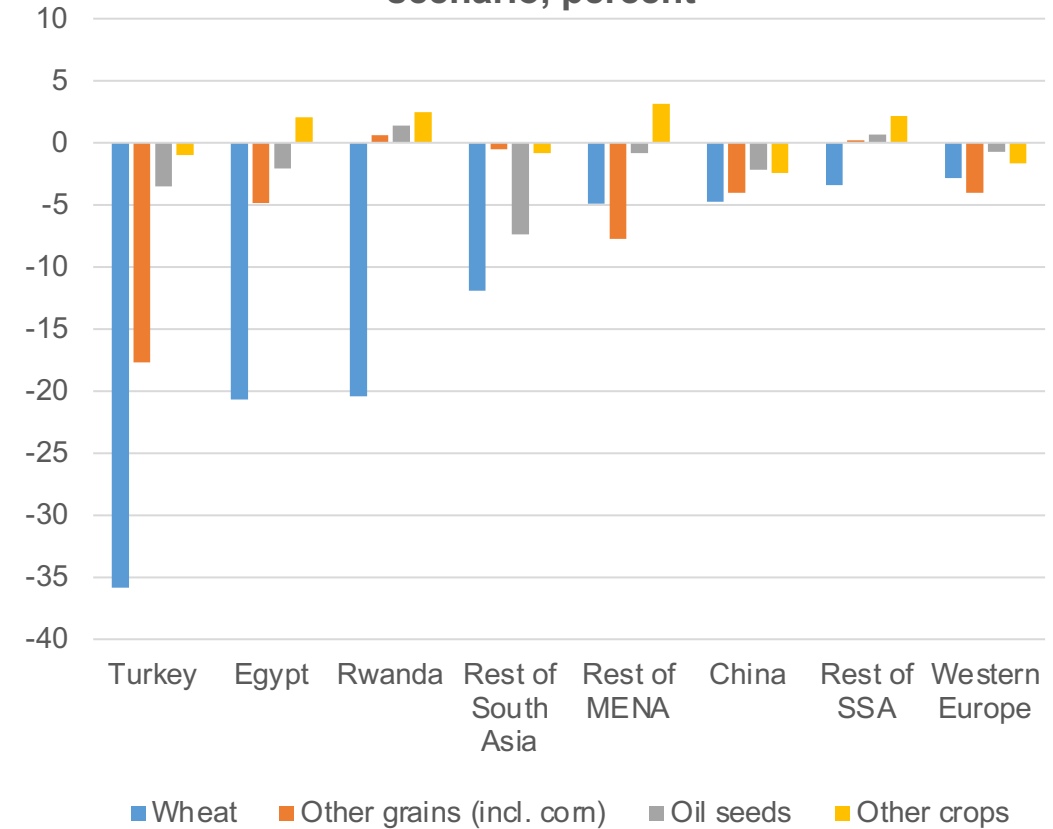


# Net agricultural and energy importers are impacted the most

Change in real income in selected countries and regions, percent



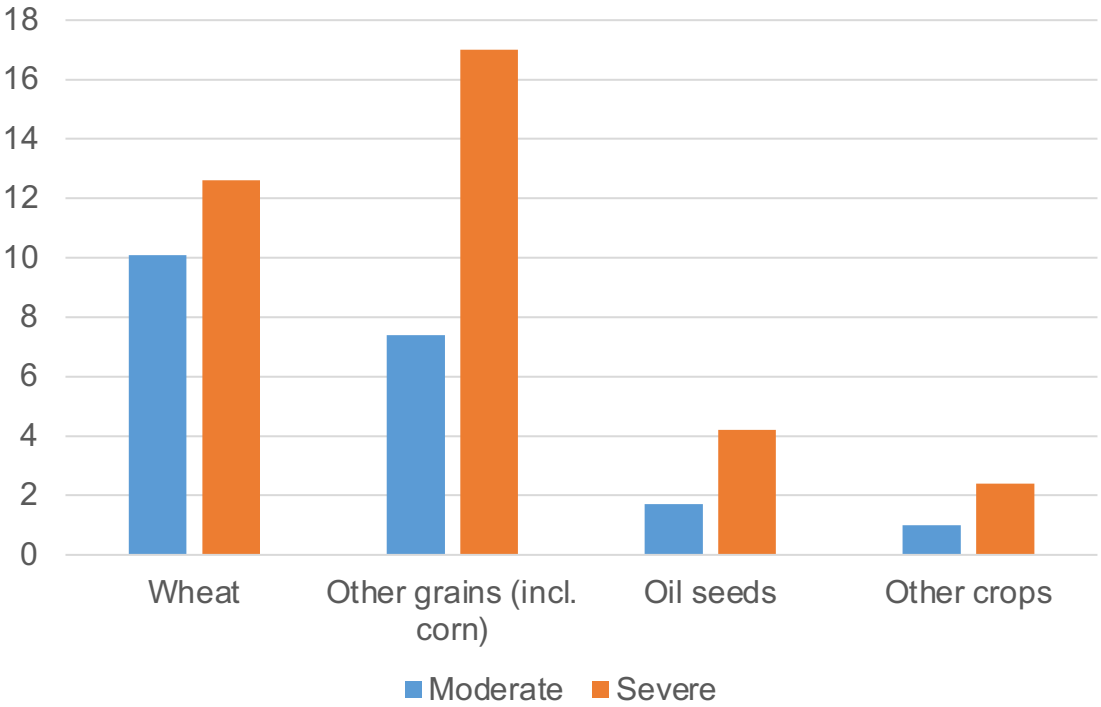
Change in agricultural imports under moderate scenario, percent



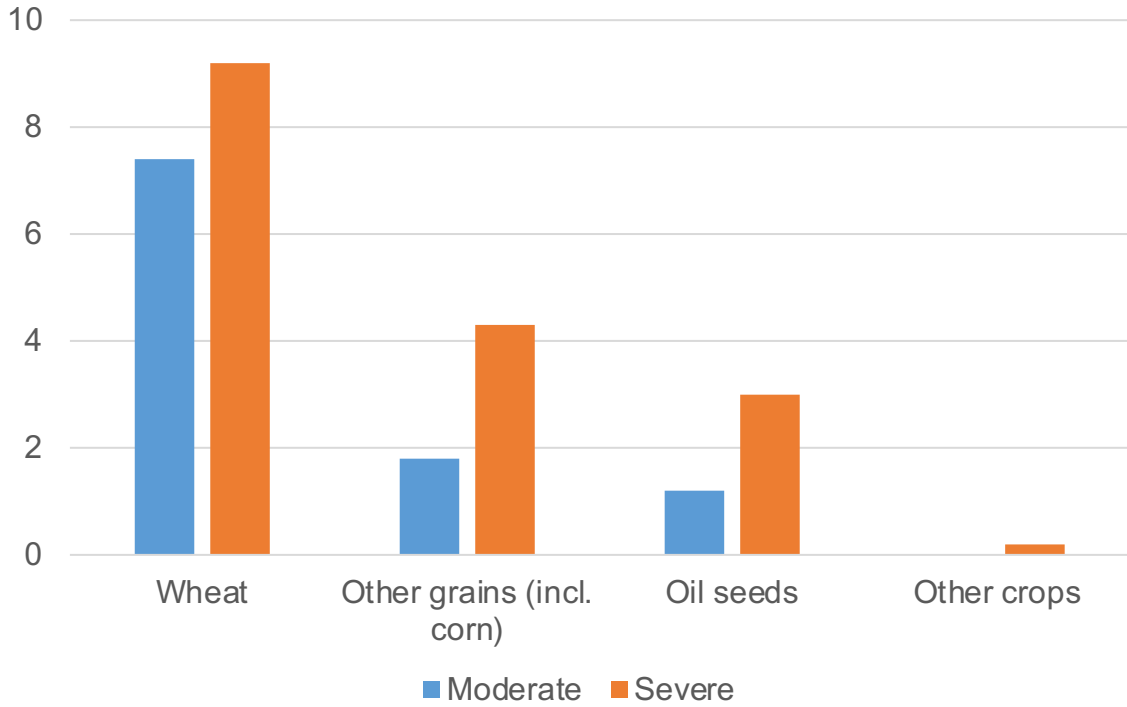
Source: authors estimates.

# Can the U.S. step up?

Change in U.S. exports, percent



Change in U.S. output, percent

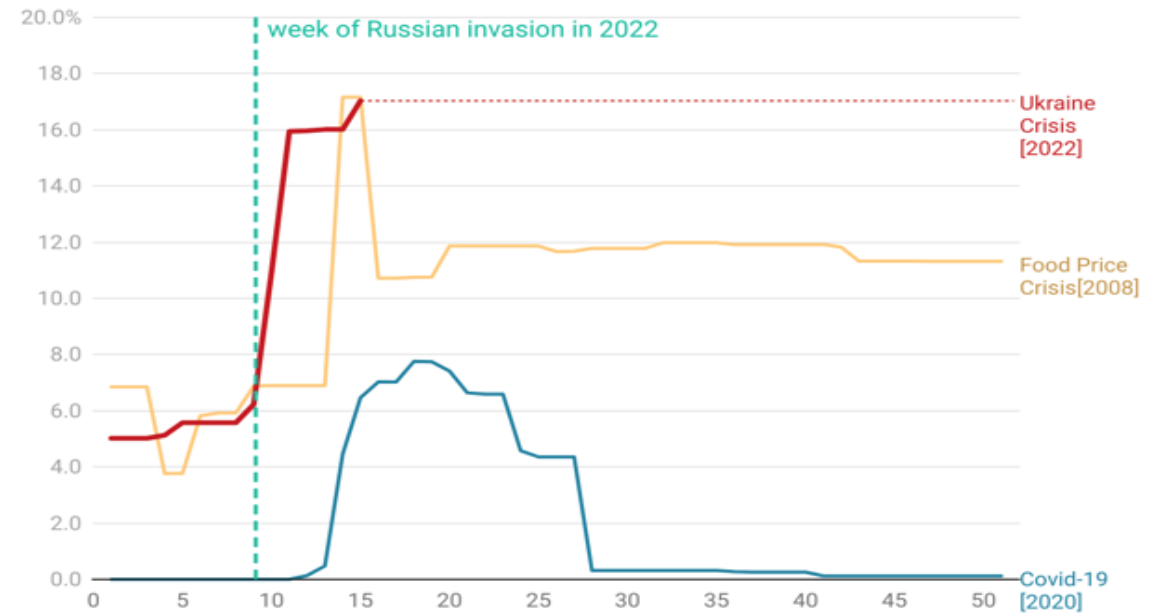


Source: authors' estimates.

# The impact of war is exacerbated in many other ways

- **Increasing demand following recovery from the Covid pandemic**
  - Growing demand for energy, transportation services
- **Adverse weather events are impacting yields worldwide:**
  - Devastating floods in South Sudan
  - Heat waves in India
  - Droughts in North America and Europe (e.g. France)
  - Drought stress and heat waves in Brazil (heavy crop losses in the Southern region and part of the Brazilian Midwest)

**Evolution of the share of global trade, in calories, impacted by export restrictions**



X-axis shows the week of the year. 1= first week of the year. Data extracted from the Export restriction tracker on April 12th 2022.

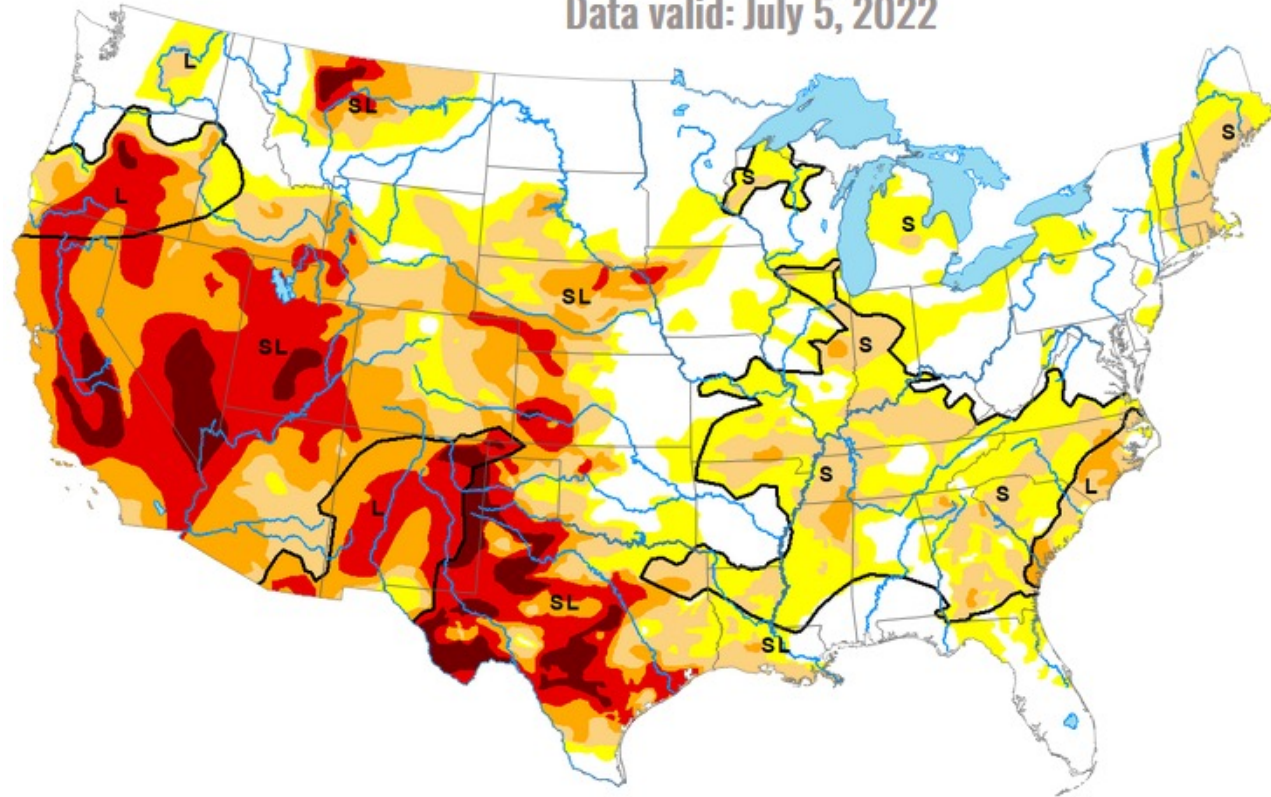
Chart: David Laborde • Source: IFPRI

## Food export restrictions put pressure on global food security:

For instance, India announced in May that it is shutting down all grain exports as a domestic food security measure

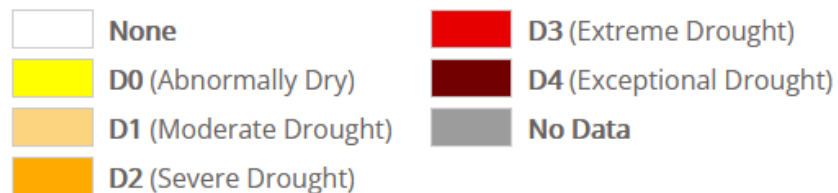
# U.S. Drought Monitor shows mounting pressure

Data valid: July 5, 2022



Source:  
<https://droughtmonitor.unl.edu/>

## Intensity and Impacts



~ - Delineates dominant impacts

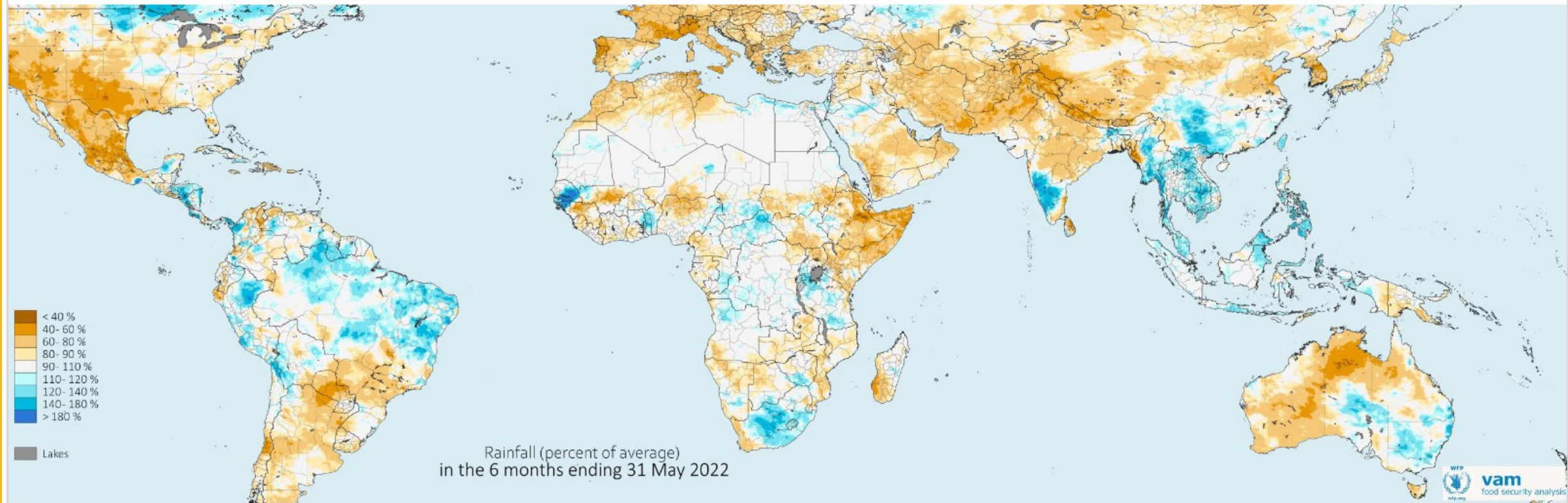
S - Short-term impacts, typically less than 6 months (agriculture, grasslands)

L - Long-term impacts, typically greater than 6 months (hydrology, ecology)

SL - Short- and long-term impacts

# Global drier conditions are observed

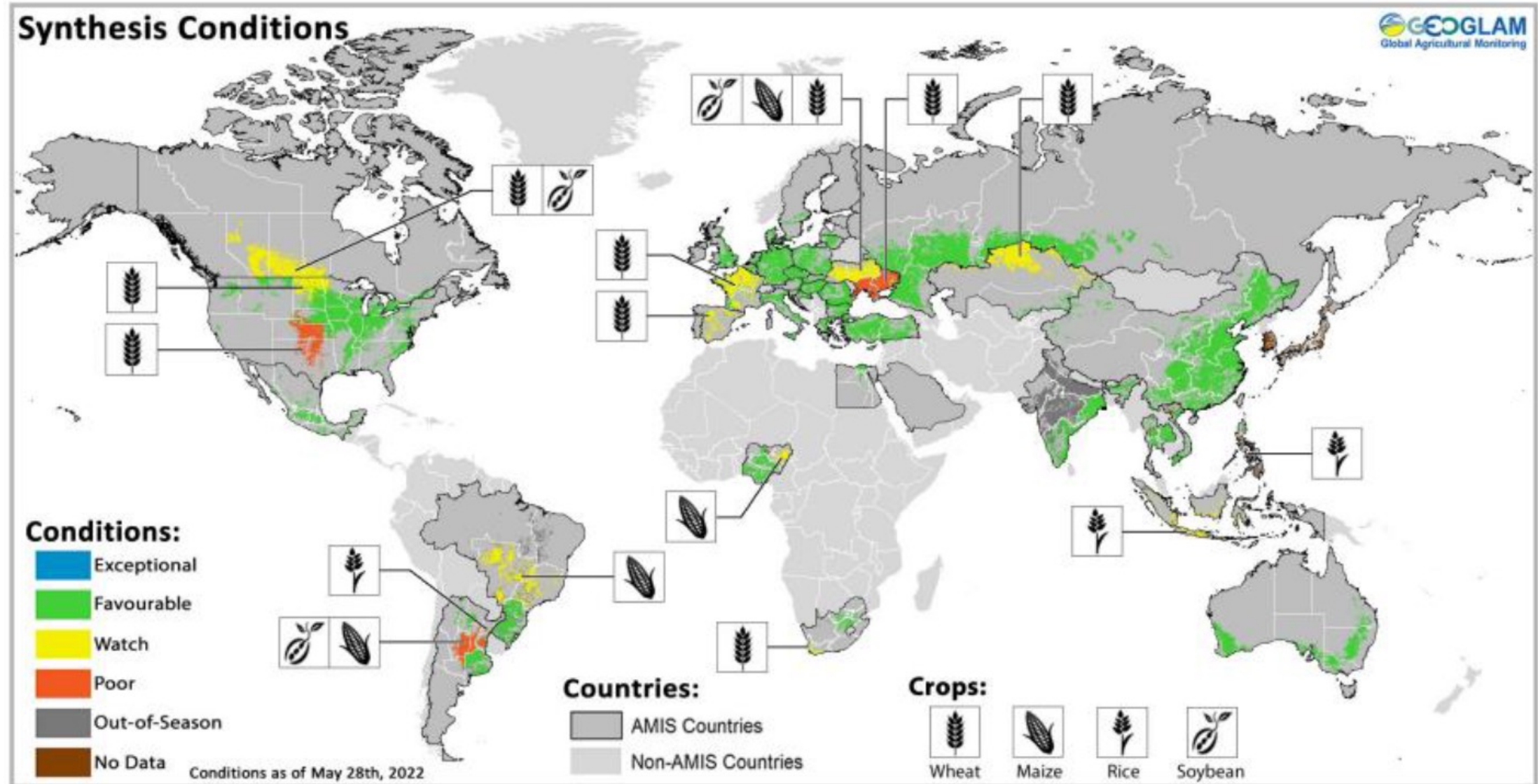
Rainfall (percent of average) in the 6 months ending 31 May 2022



Source: World Food Program <https://reliefweb.int/report/ukraine/global-climate-context-ukraine-war-june-2022>



# Adverse weather impacts crop production perspectives





# Energy sanctions are further mounting pressure on economies around the World

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## Cutting Russia's fossil fuel exports: Short-term pain for long-term gain

Maksym Chepeliev, Thomas Hertel, Dominique van der Mensbrugghe 09 March 2022

In response to the invasion of Ukraine, most OECD countries have announced punishing sanctions against Russia. But the sanctions have so far failed to target Russia's primary source of foreign exchange – exports of fossil fuels. This column argues that while the short-term impact of restricting Russia's fossil fuel exports on EU households' real income would be non-trivial, the longer-term cost would be more modest and would be offset by considerable environment co-benefits. Meanwhile, the adverse impacts on the Russian economy would be overwhelming.



On 24 February, Russia launched an unprovoked attack on Ukraine, invading its territory on multiple fronts, including from neighbouring Belarus. As the entire Ukrainian nation has entered a fight for democracy and the country's independence, most of the countries of the OECD, including the US, Australia, Canada, South Korea, Japan, the UK and the EU, have announced punishing sanctions against Russia. These include restrictions on financial transactions, freezing assets of Russia's major banks and selected individuals, banning exports of high-tech equipment to Russia, as well as closing the airspace for Russian flights. Notably absent at the time of writing this column is one of the most painful items for the Russian economy – restrictions on the export of fossil fuels. This is the country's primary source of foreign exchange.

This exception is hardly surprising. During 2019, the EU and UK imported over US\$118 billion worth of fossil fuels from Russia, with Germany, Netherlands (largely re-exports), Italy, Poland and France among the top destinations (Figure 1). During earlier periods with higher energy prices, the corresponding import flow was even larger. Indeed, the value of this import flow exceeded \$181 billion in 2014.

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**Dominique van der Mensbrugghe**  
Research Professor and Director of the Center for Global Trade Analysis, Purdue University



A panel of expert economists who have studied the impact of a ban on Russian oil and gas on the EU economies will explain their findings on **31/3/2022** from **12.00 to 13.30** at the **European Parliament (ASP 1E2)**.

**Maksym Chepeliev** Purdue University

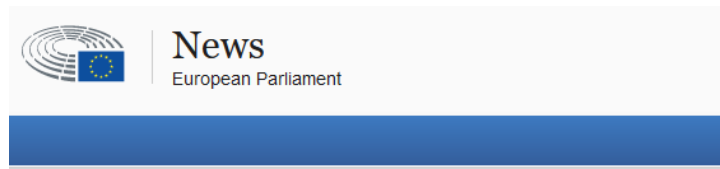
**Ben Moll** London School of Economics

**Karen Pittel** University of Munich

**Georg Zachmann** Bruegel

Hosted by **Luis Garicano**  
MEP and Professor of Economics.

With the participation of  
**Oleg Ustenko**, Economic Adviser to President Zelensky



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## MEPs demand full embargo on Russian imports of oil, coal, nuclear fuel and gas

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## Cutting Russia's Fossil Fuel Exports: Short-Term Economic Pain for Long-Term Environmental Gain

Maksym Chepeliev, Thomas Hertel, Dominique van der Mensbrugghe

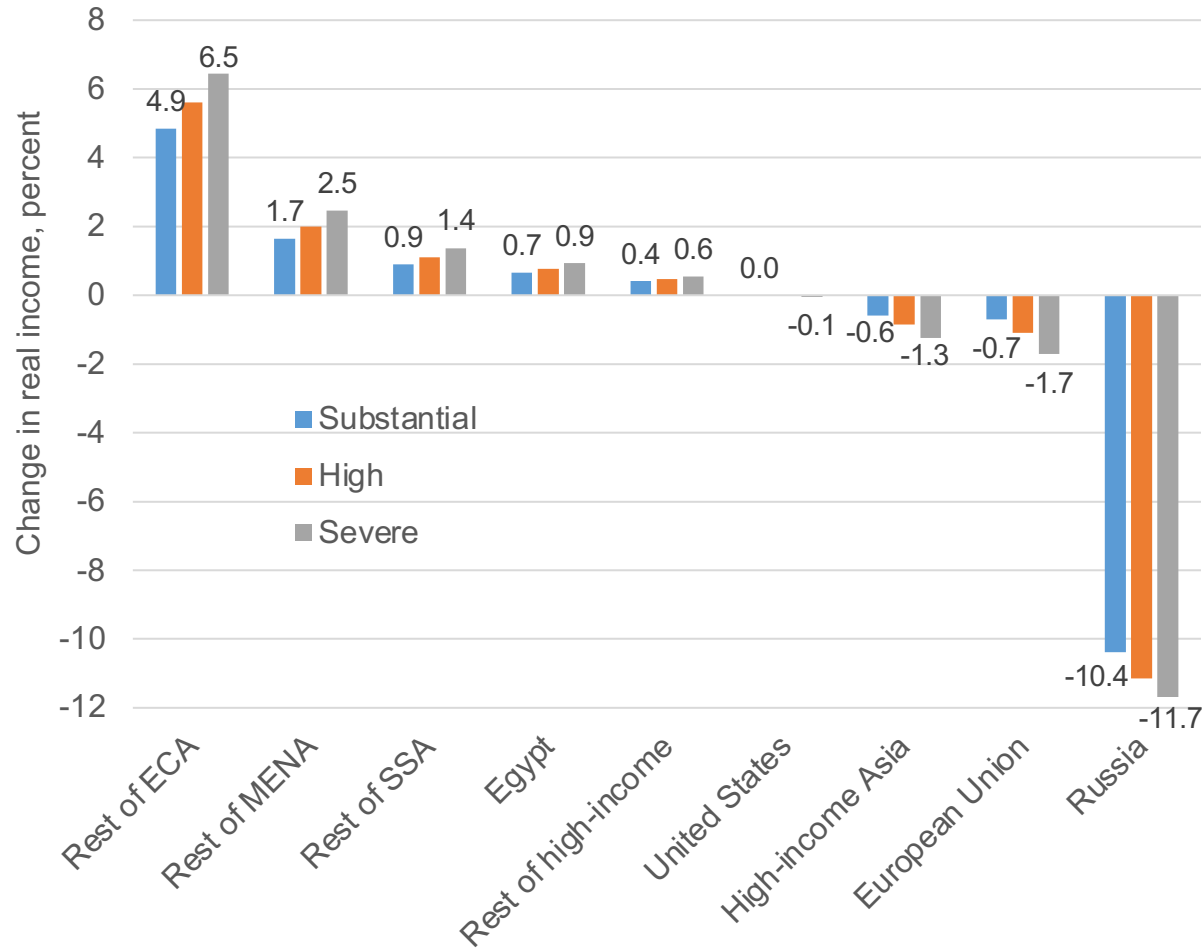
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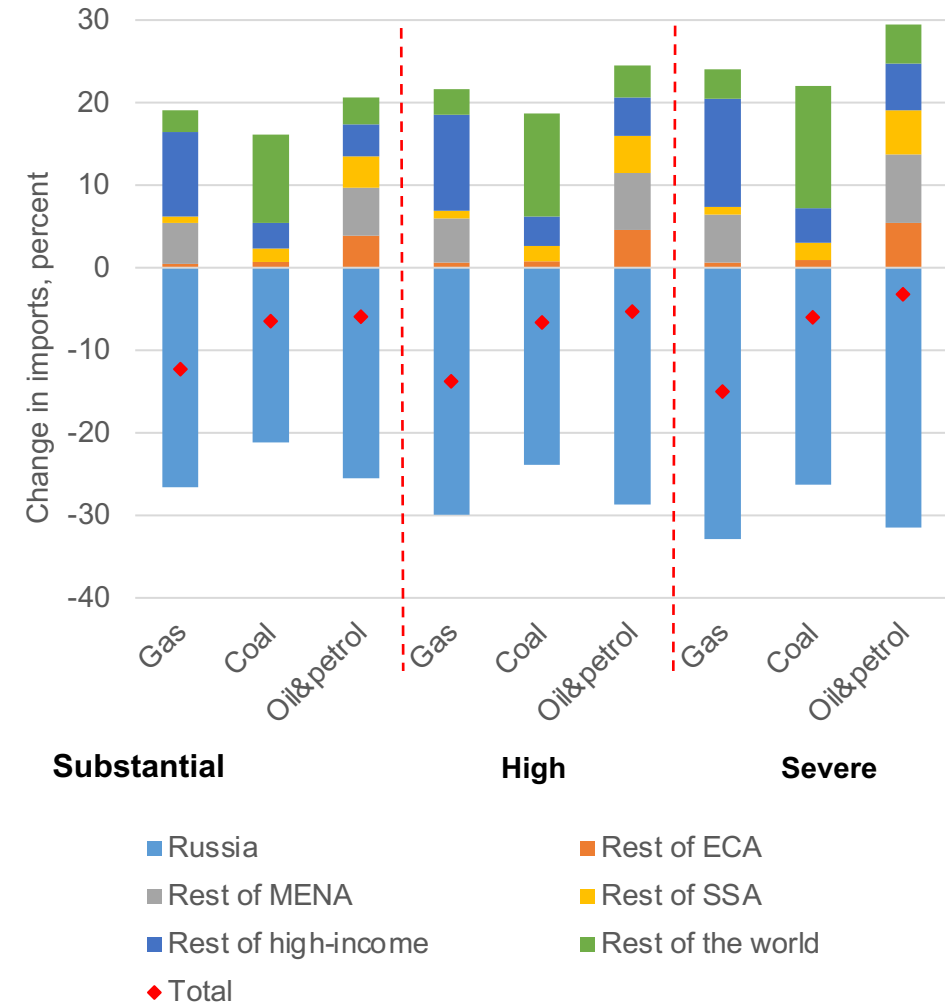
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# There are winners and losers across the World

Change in real income by regions, percent



Change in EU energy imports by source, percent



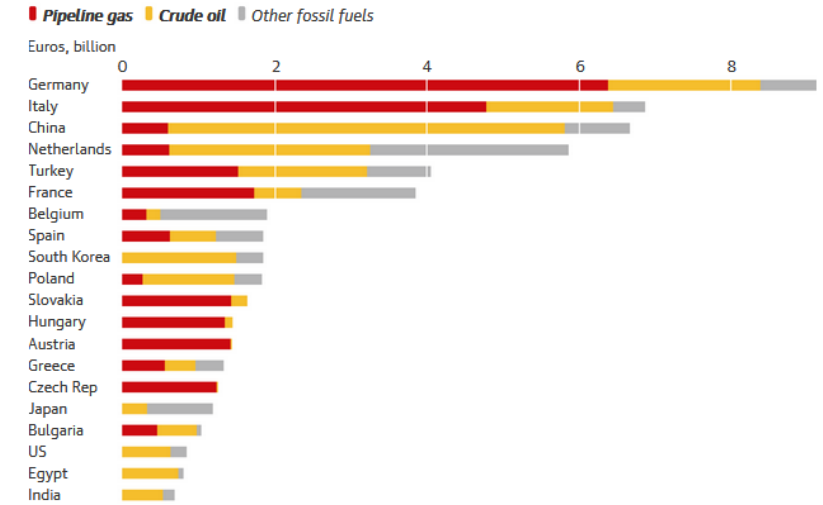
Scenarios: Substantial (-80% energy imports from Russia), High (-90%), Severe (-99%).

# Reality check: Energy markets are distorted in many other ways

Energy prices have soared since invasion:

- 45% increase in oil prices (w.r.t. 2021) and >60% in natural gas prices (Dutch TTF in Apr w.r.t. Nov 2021).
- *Price pressure has been mounting prior to the War.*
- *(Near) flat supply curve from OPEC.*

Russia's revenue from fossil fuel exports soared to €62bn in the first two months of the country's war against Ukraine



Guardian graphic. Source: CREA. Note - top 20 importers shown. Other fossil fuels includes coal, liquid petroleum gas and oil products from the period 24 February to 24 April 2022

- Combined price increases are much higher than from energy import bans only.
- Russian budget is estimated to earn 30% more from energy exports in 2022 than in 2021.
- Price caps on energy exports from Russia are being considered by Western Allies to make sanctions more efficient.
- ***Should not expect energy price to decrease substantially in the nearest future.***

**Further stress the importance of energy security and decarbonization efforts**

# Conclusion

- **Russia's invasion of Ukraine has adversely impacted global agricultural, energy and fertilizer markets:**
  - Immediate supply disruptions (corn and wheat shipping).
  - Drastic short-term price increases, including energy and fertilizer (would this become a new normal?).
  - Longer-term impacts on planting and harvesting (projected 20%-30% decline in 2021/2022 yields in Ukraine).
  - Infrastructural constraints on exporting grains from Ukraine (sea ports are blocked).
- **Opportunities for other countries to step up:**
  - War is having devastating impacts on food security (up to 47 million more people could face food insecurity and starvation).
  - Increasing global demand could be expected for wheat and corn, in particular.
  - Situation is complicated by adverse weather conditions around the World.
  - U.S. is one of the countries that could step up by filling the gap in global agricultural supply.



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# Thank you!

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