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Current Events and Volatility in Aqua Feed Ingredients: The Journey to Sustainable Commodities

Abstract

Current Events and Volatility in Feed and Food Market Ingredients
In a globalized world where food production and consumption happen in different areas, international trade tends to increase. There are three major events that have increased the uncertainties in production, processing, packaging, transportation and even finance of feed ingredients. Managing risk in volatility and availability will be the key to transforming food systems in order to be able to address food security, ensuring production becomes more resilient while respecting planetary limits. The three major world events that will be discussed in this presentation are the Covid pandemic, the conflict in Ukraine, and Climate Change.

Effects of the Covid-19 pandemic
Aquaculture is shaping to be one of the most important food security solutions for years to come. Aquafeed production is the backbone of aquaculture and understanding the implications that the afore-mentioned major events have on price and availability of feed ingredients is critical to its success.

Feed ingredient prices have increased dramatically. These include major protein ingredients like soy, vegetable oils, sorghum and corn. This is due, in part, to the Covid crisis causing significant increases in logistics prices. In some instances, the price of ocean vessel freight jumped more than ten times. To make matters worse, planning of shipments and on-time deliveries have become difficult to manage, and stricter cargo inspections due to biosecurity concerns added to the challenges and complexities of feed ingredient procurement and formulation.

Conflict in Ukraine

As much of the world has only recently and painfully become aware, Ukraine is a major producer and exporter of corn and vegetable oils among other key commodities. The war and resulting disruption of Ukrainian exports have resulted in supply scarcity, creating significant price increases in the prices of these commodities and a domino effect on alternative commodity prices. Agricultural price hikes pressure expansion of cropland. Unfortunately, this expansion usually happens in newly cleared land rather than in rehabilitated degraded land, which almost inevitably results in habitat conversion.

Climate change

If these two recent developments weren't enough to complicate the aquafeed equation, the effects of climate change are being increasingly felt around the world, creating serious question marks for risk managers and even for the health and survival of major companies. Increases in extreme weather events like flooding and droughts, temperature changes transforming ecosystems, and lower yields in production and/or protein content in ingredients are all new variables that need to be understood and managed very soon if there is hope to overcome the current fragility of the global food system. To demonstrate the real-world implications of the above factors, we will explain the soybean complex and how aquafeed is affected when key ingredients such as soy protein and soy oil are subject to supply disruption.

Current and evolving conditions such as described strongly indicate that there needs to be a systemic transformation of the global food system, and aquaculture and aquafeed can form a large part of the solution.

Implications of current and future market conditions for aquafeed

Aquafeed formulas include terrestrial and marine ingredients and volatility in prices of land and sea-based ingredients is a continuing issue. The still unknown near and long-term effects of climate change remain a challenge that will demand a close look at both supply chains in order to evolve management strategies to ensure resilience.

We will explore some of the important aspects that must be taken into account for a resilient aquafeed landscape:

- Alternative feed ingredients
- Traceability and transparency
- The link between habitat conversion and high emissions on supply chains and Scope 3 Carbon
- Data collection and metrics to model and manage ingredient volatility.
- Waste management and responsible supply chains

Our presentation will connect these dots and deliver insights on how to manage the feed challenge for this volatile future..

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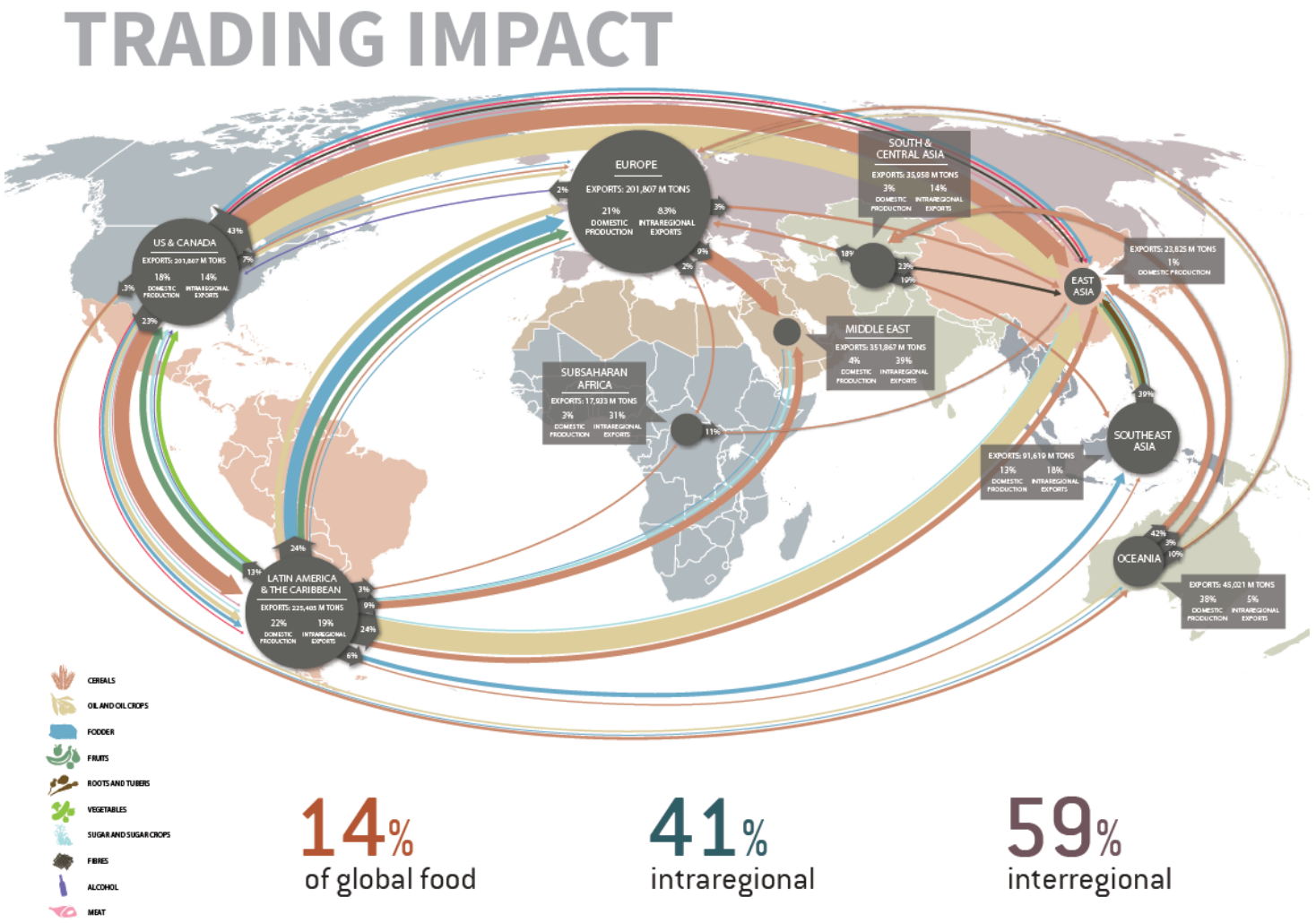
Karla Canavan
WWF

TARS 2022
The Aquaculture Roundtable Series

Population map 2018

Global trade flows:



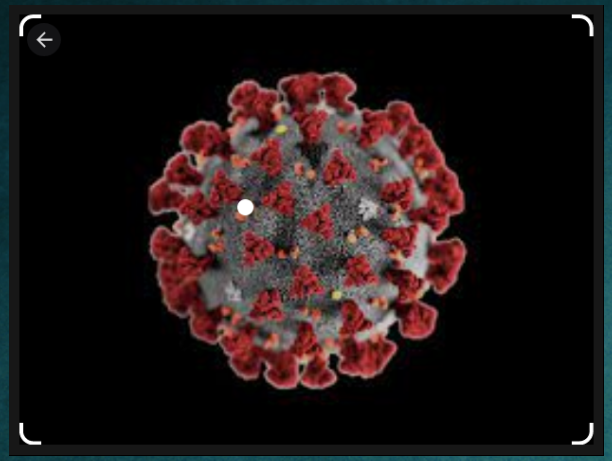
Key export regions

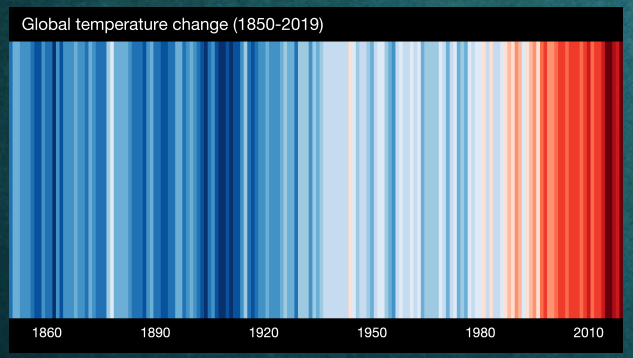
- North America (US, CA)
- Latin America
- SEA
- Black Sea
- Australia

Key import regions

- East Asia (China)
- EU
- Latin America
- Middle East

Source: Metabolic (2017 Food Systems Analysis), USDA statistics





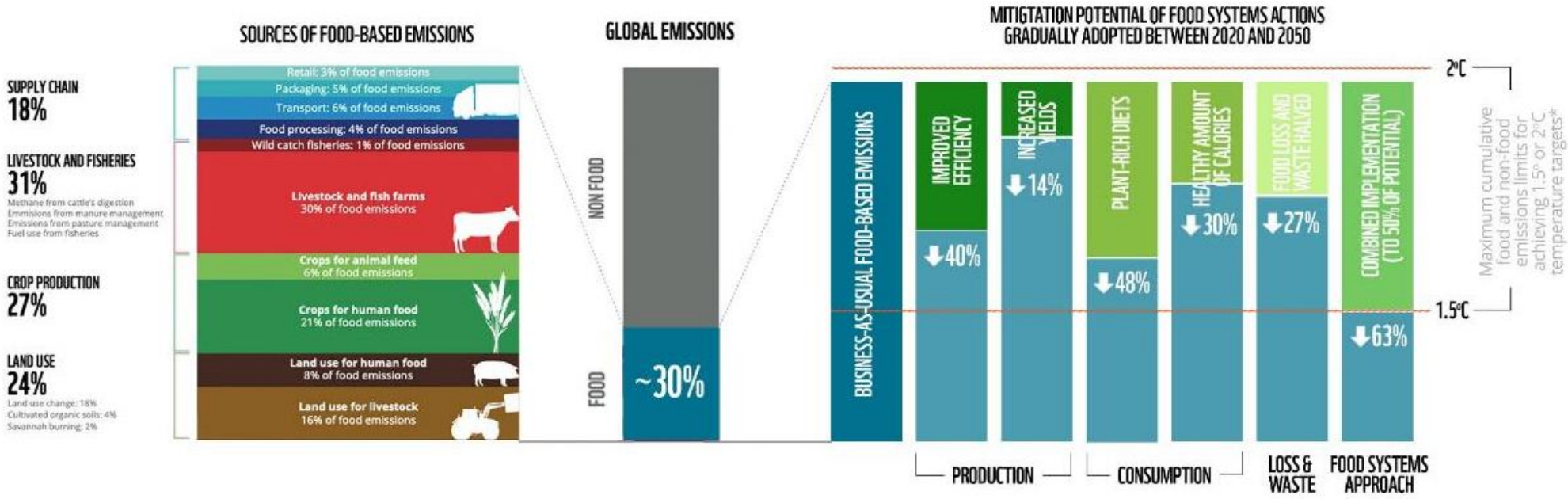
The challenges

- Covid Pandemic Logistics, supply chain disruption
- Conflict in Ukraine scarcity of commodities issues of food security
- Climate Change Major Uncertainty, stranded assets, yield variation, spikes, social migrations

V O L A T I L I T Y

Systemic change needed

BEYOND AGRICULTURE: FOOD SYSTEMS AS OUR FOCUS



Adapted from *Bending the Curve: The Restorative Power of Planet-Based Diets* (WWF) and *Global food system emissions could preclude achieving the 1.5° and 2°C climate change targets* (Clark et. al.)

For illustrative purposes only

* Assumes linear reduction to decarbonisation in 2050 in all other sectors

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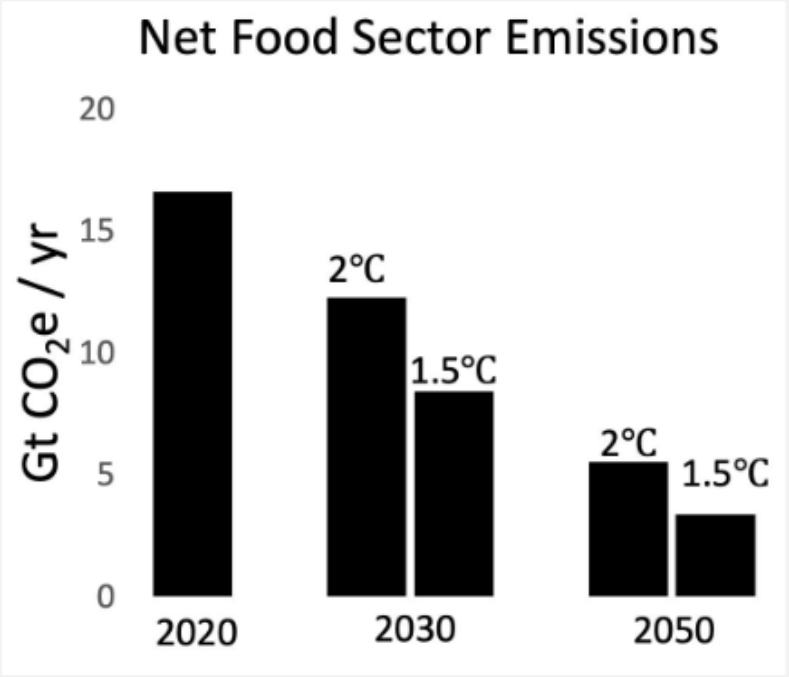
1. Climate targets cannot be met **without action from the food and land sector**

1/3

of total GHG emissions
are contributed by the food system

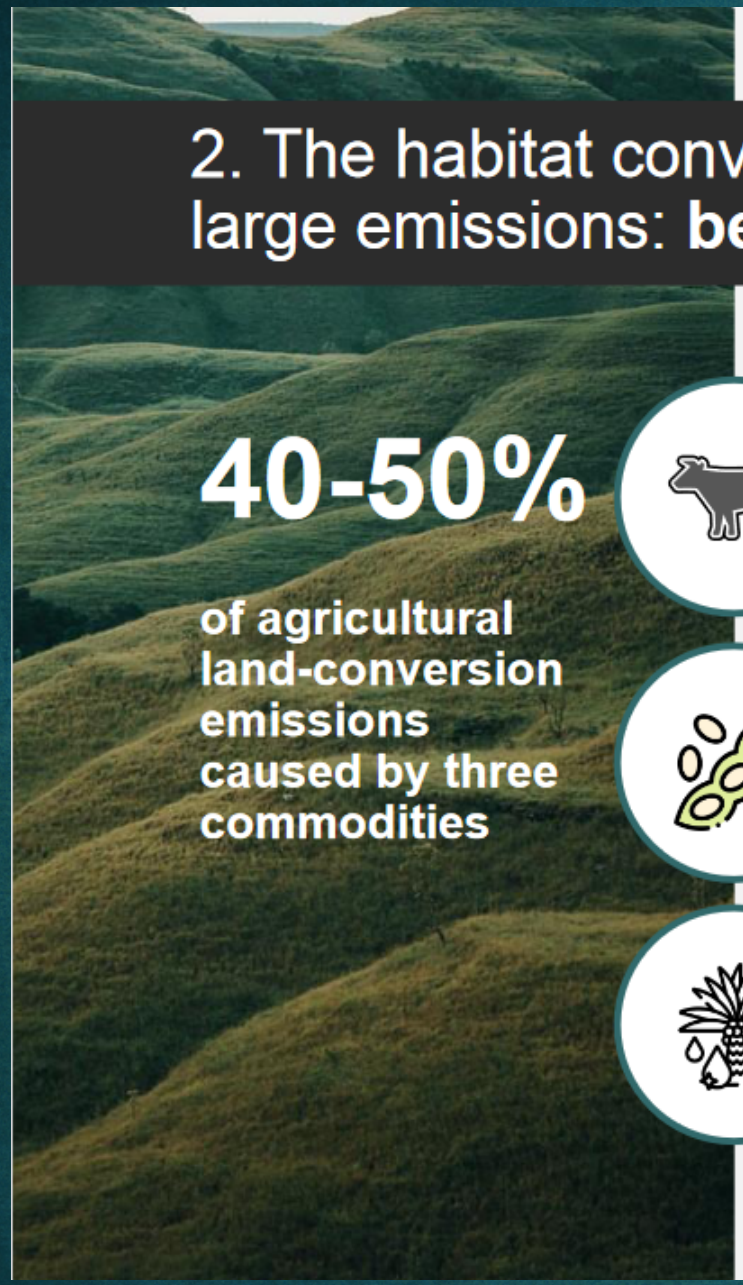
Emissions from the food system need to decline by about 80% by 2050 for aligning with a 1.5 degree pathway



- This 80% absolute decrease in emissions **includes <u>elimination</u> of commodity driven deforestation**
- Land sector is also **expected to sequester carbon through soils and agroforestry biomass**

Source: Roe et al. 2019; IPCC, AR6 WG3

2. The habitat conversion of three commodities has especially large emissions: **beef, palm oil, and soy**



40-50%

of agricultural land-conversion emissions caused by three commodities

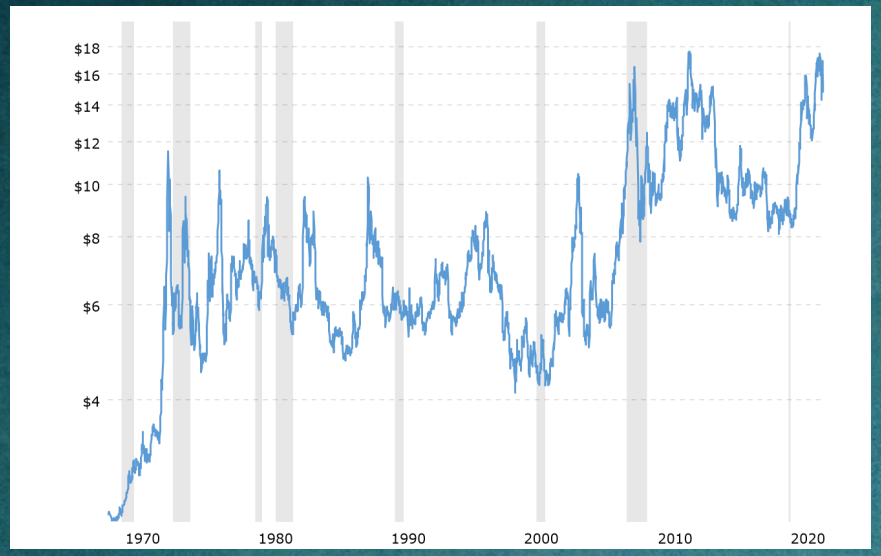
Land conversion for cattle is responsible for **17-34%** of food system LUC emission (4-9% of total food systems emissions)

Land conversion for soy is responsible for **5-14%** of food system LUC emissions (1-3% of total food system emissions)

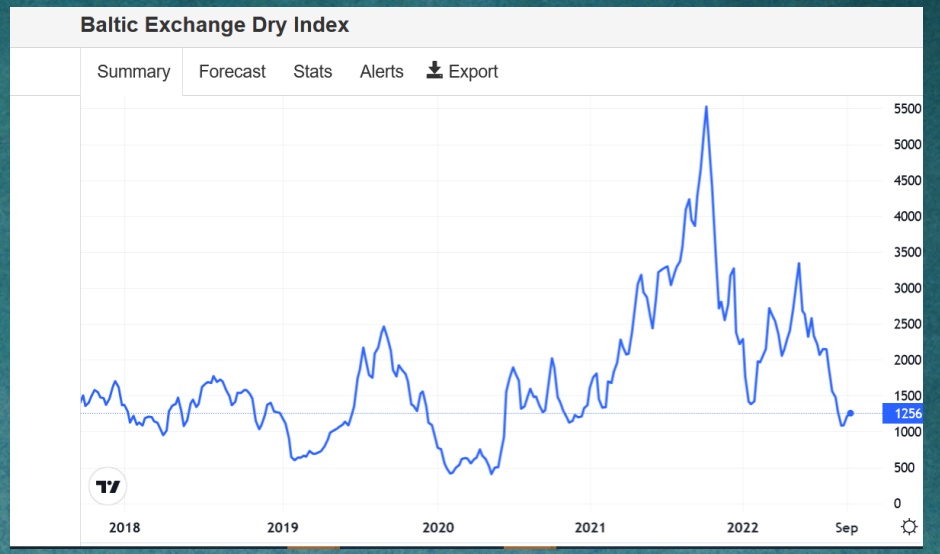
Land conversion for palm oil is responsible for about **8%** of food system LUC emissions (~2% of total food system emissions)

Source: Adapted from Global Forest Watch, Poore & Nemecek (2018)

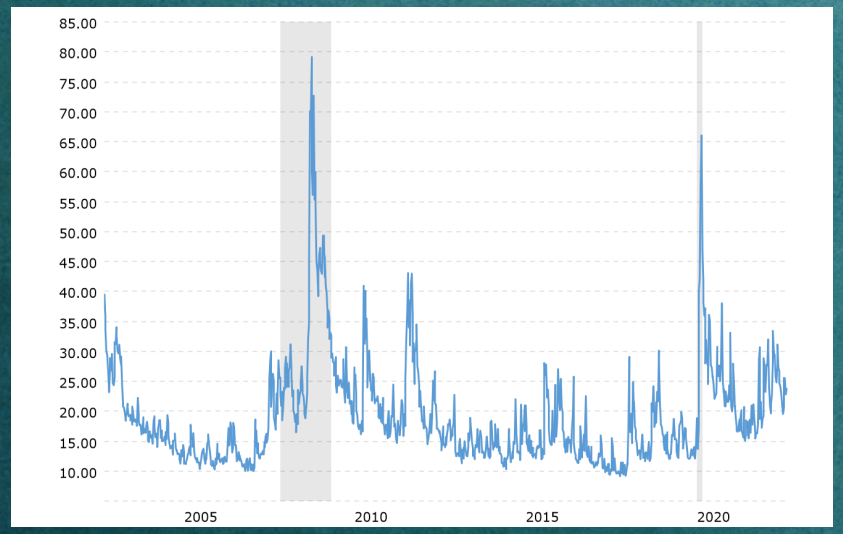
Selected Price charts and Volatility



Soybean prices (cts/bu)



freight index



VIX

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What are the commodities should we focus on?

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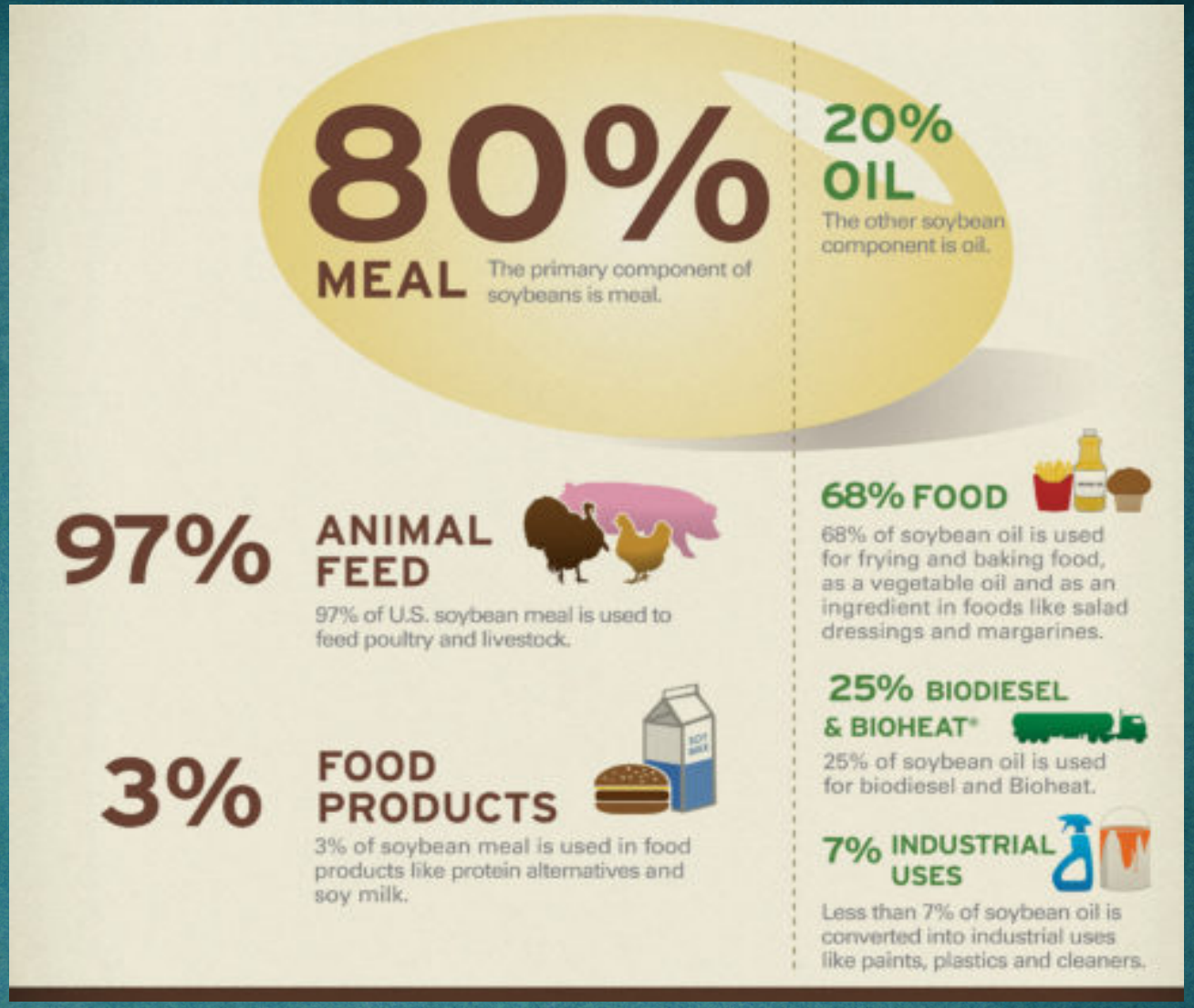
Feed Formula

- Energy - Carbs (corn, wheat, rice)
- Protein - Soy meal, fish meal, cottonseed meal
- Other - DDGS Corn ethanol
- Soymeal feed usage across geographies and species is around 20%-30%

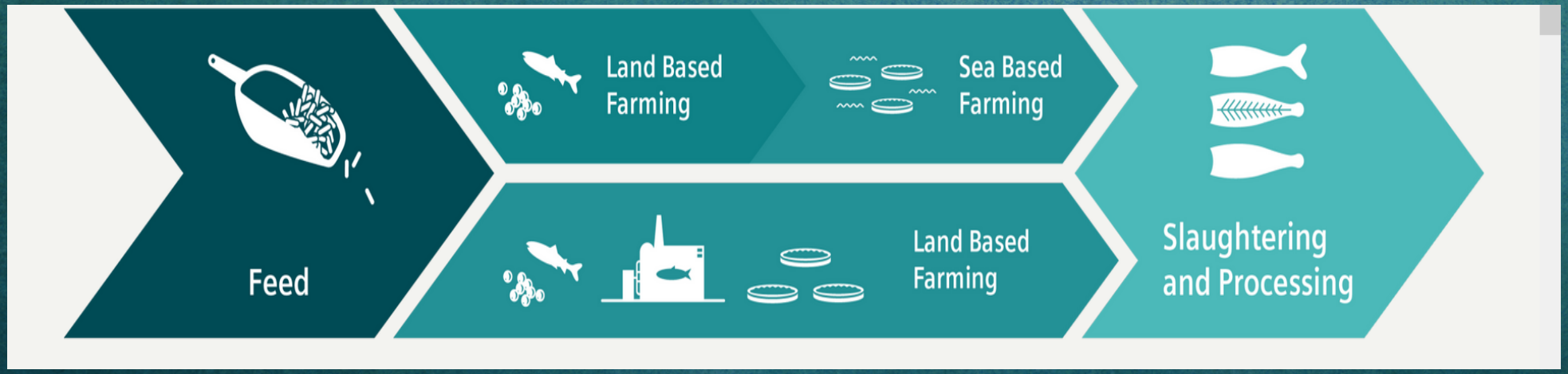


The Supply chain approach

Farm level

Inputs → Planting harvesting → Waste

Aqua production

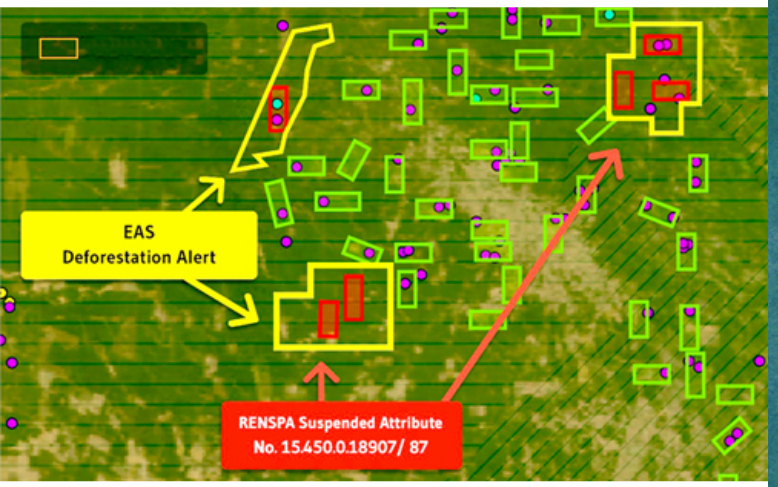


Triple bottom-line sustainability

Socially Responsible

Environmentally Sound

Economically Viable



What's needed for resilience?

- Assessment of where gaps in supply chain control increase risks
- Link between habitat conversion and scope 3 carbon
- Establish full supply chain traceability and determine gaps
- Suppliers and supply assessment, feasible supplier and supply ingredient alternatives, (ESG feed tool, etc)
- Aquaculture is a major solution , feed is key

Issues along the supply chain: Waste

- Inputs Fertilizers and chemicals: run off / soil health/ biodiversity loss
- Post harvest loss
- Manure/ industrial process waste
- Food loss and waste
- Consumption waste

70% of biodiversity loss

70% of freshwater use

24% of GHG emissions

90% of marine stocks fully exploited

Most chemical use

50% of topsoil loss

key points on Animal protein

- **Cooperation:** Protein challenge is global (associations, platforms, governments, NGO s) whole supply chain including finance and transportation
- **Triple bottom line:** Social, environmental and economic
- **Climate change and scope 3 carbon** Evaluate and measure supply chain emissions (farm to gate)
- **Efficiency:** Better management practices, feed conversion ratio. Absolute, more nutrients per kilo, less waste, absolute footprint reductions
- **Supply chain approach:** Diagnosis / Risk assessment, action plan. Measurable, progress can be monitored, based upon traceability and transparency

Takeaways:

- Resilience needs long term view
- Data and metrics need to improve
- Dynamic Risk Management
- Deep dive into the supply chain is a must
- Carbon and conversion are related and effects need to be managed together
- Traceability is key
- Incentives should be aligned
- Systemic change is needed

Thank you