# Environmental Impact assessment of Food Production

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MONTHLY GLOBAL

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# Data Analysis Process?

**01** **Ask**

Define the problem you're trying to solve

**02** **Prepare**

Choose data sources

**03** **Process**

Clean the data , maintain data integrity

**04** **Analyze**

Make data-driven decisions

**05** **Share**

Successfully communicate your findings

**06** **Act**

Make decisions

# Defining business situation [ Environmental impact assessment of food production ]

### IDB Inter-American Development Bank

Our client (IDB) hired us as consultants to assess:

**ENVIRONMENTAL IMPACT** of a series of **AGRICULTURAL PROJECTS** for **FUNDING**

**+**

### Funding for ..?

**CASH CROP** - agricultural crop

**Brazil, Colombia, Costa Rica and Mexico** evaluated to approve or reject funding

**→**

### Funding evaluation ..? Do we ACCEPT or REJECT ?

Analyzing environmental impact markers **food production cycle**, we focused on:

- **FRESH WATER** resource
- **WATER SCARCITY** per country

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# Exploring **[ Dataset ]**

**Missing values**

**Combine Two datasets**

**Dropping unwanted columns**

Datasets references:

Environment Impact of Food Production    Kaggle.com   2020

Water-scarcity Water Footprint       Our World in Data  2020

# Dataset

```
df.columns
```

```
Index(['Food product', 'Land use change', 'Animal Feed', 'Farm', 'Processing',
       'Transport', 'Packging', 'Retail', 'Total_emissions',
       'Eutrophying emissions per kilogram',
       'Freshwater withdrawals per kilogram',
       'Greenhouse gas emissions per 100g protein', 'Land use per kilogram',
       'Scarcity-weighted water use per kilogram'],
```

Environmental Markers

- Total_emissions
- Eutrophying emissions per kilogram
- Freshwater withdrawals per kilogram
- Land use change

# Questions [Answers]

# 1. Food products with **highest environmental impact** considering the 4 markers: **CHEESE, NUTS**



Highest Environmental Impact Across Products for Different Markers
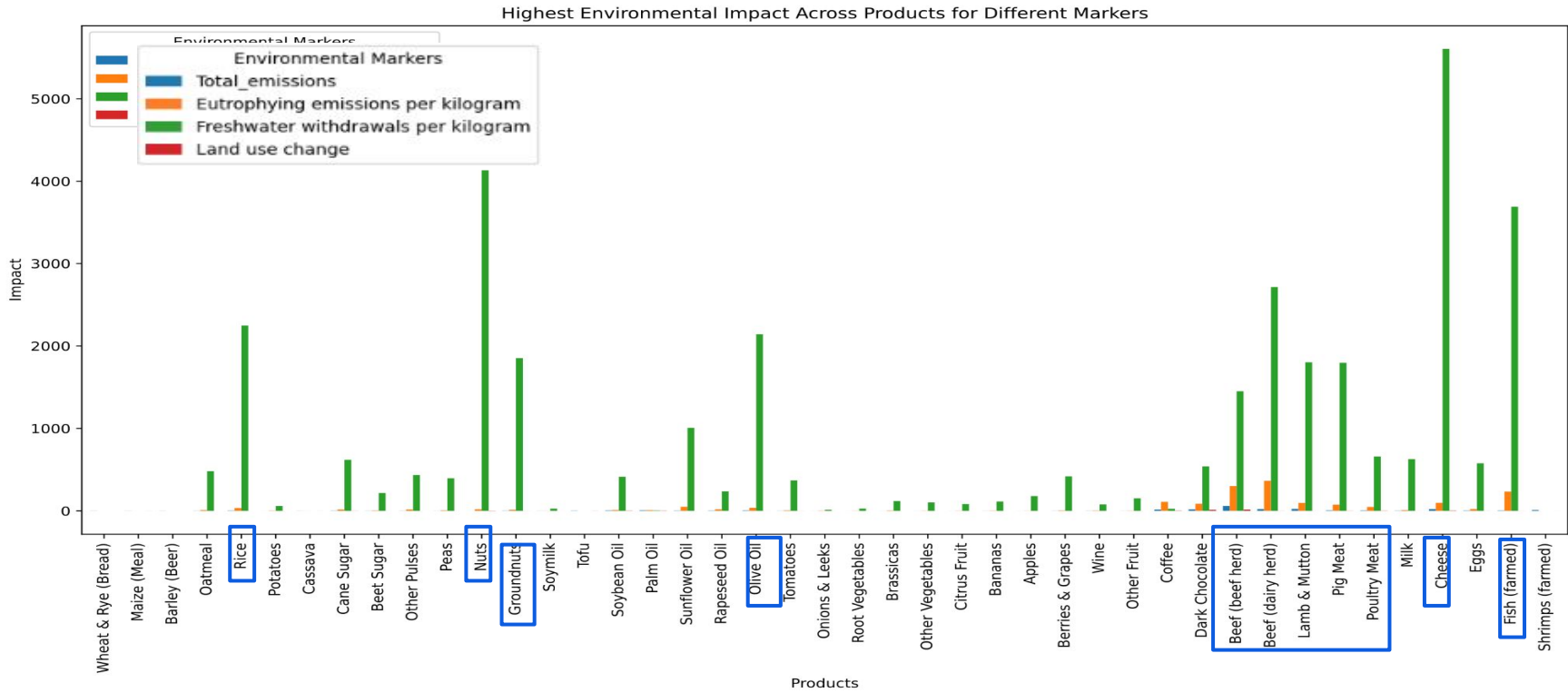
**2**. **Food production cycle** with the most **carbon emissions per KG** across all food production

Total Carbon Emissions by Food Production Step
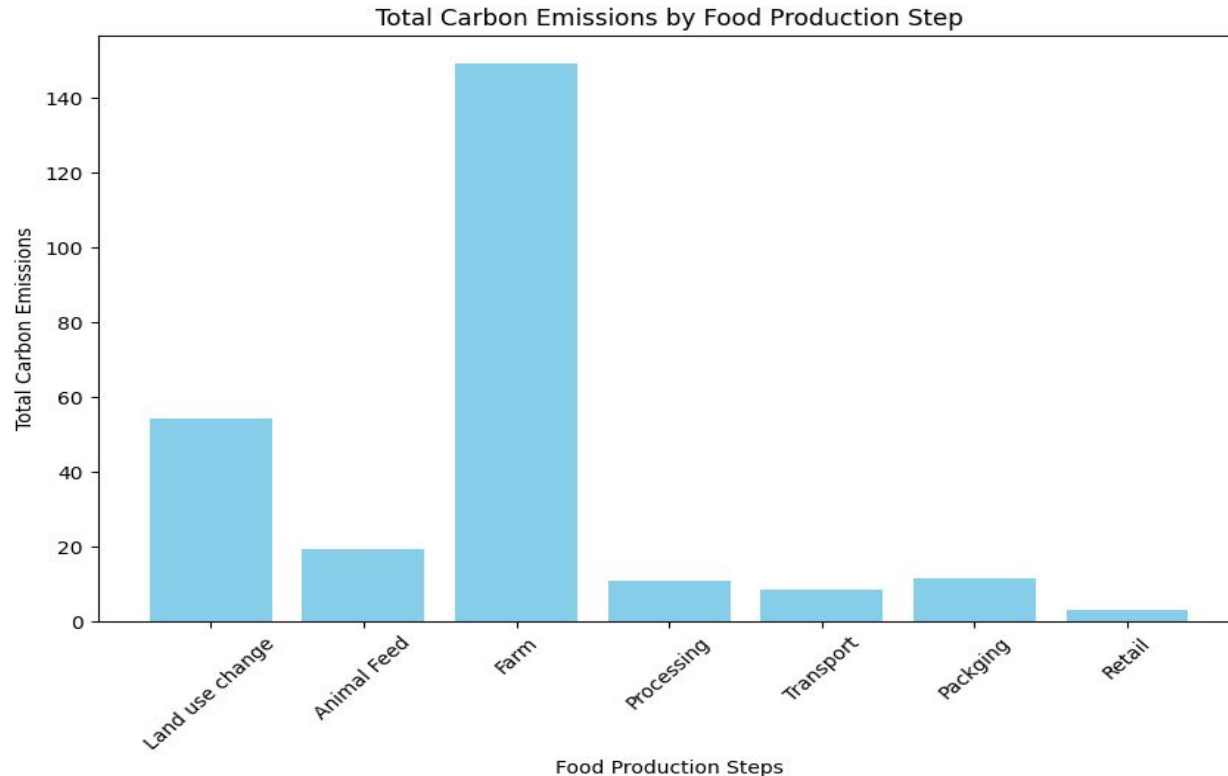


**58,1%** Farm
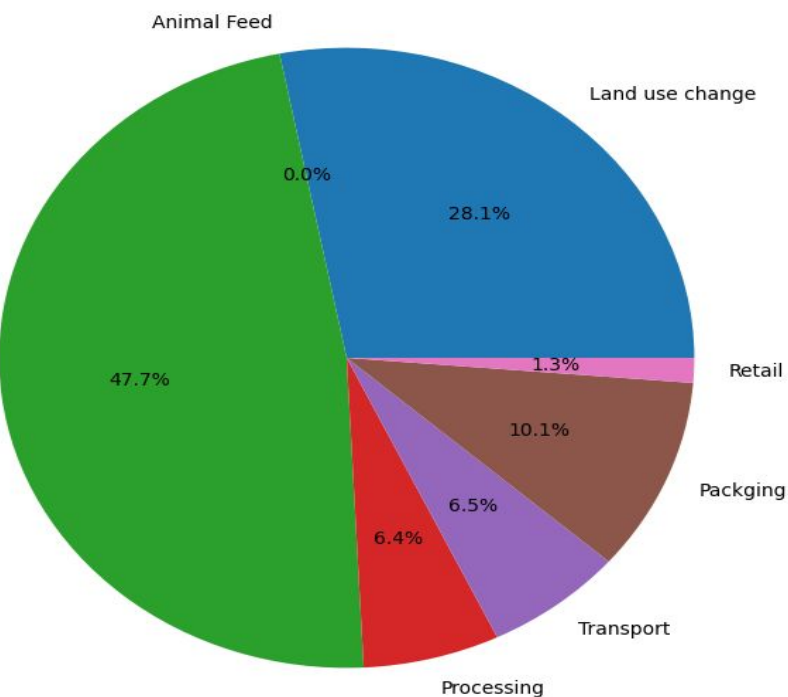**21,1%** Land use
**7,6%** Animal feed

**4,5%** Packaging
**4,2%** Processing
**3,3 %** Transport
**1,2 %** Retail

**3.** Group products categorized in **Plant and Animal based products.** **Difference?.**



Carbon intensity Animal products
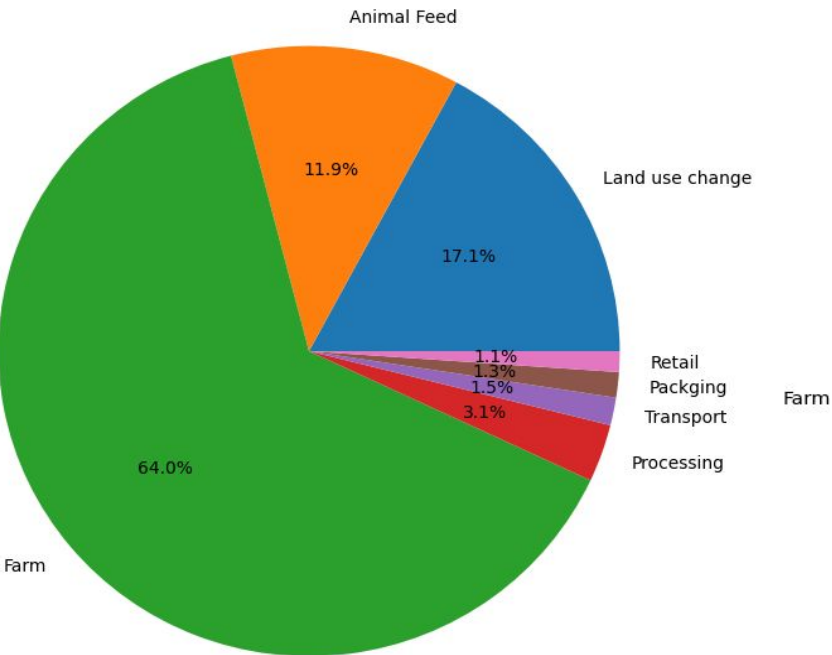
Carbon intensity Plant products

**4.** Considering only the **products** that the listed countries manifested as being interested in developing and considered for **funding BID  #Brazil, Colombia, Costa Rica, Mexico**.

- **Animal products have the highest impact** across all markers, although when analyzing only the listed products, the difference is not as pronounced.

**5.** Based in the **water-scarcity** information available, what agricultural projects would we advise the IDB (Inter American development bank) to finance (funding) in our **listed countries**?



Freshwater Withdrawals per Kilogram Across Food Products
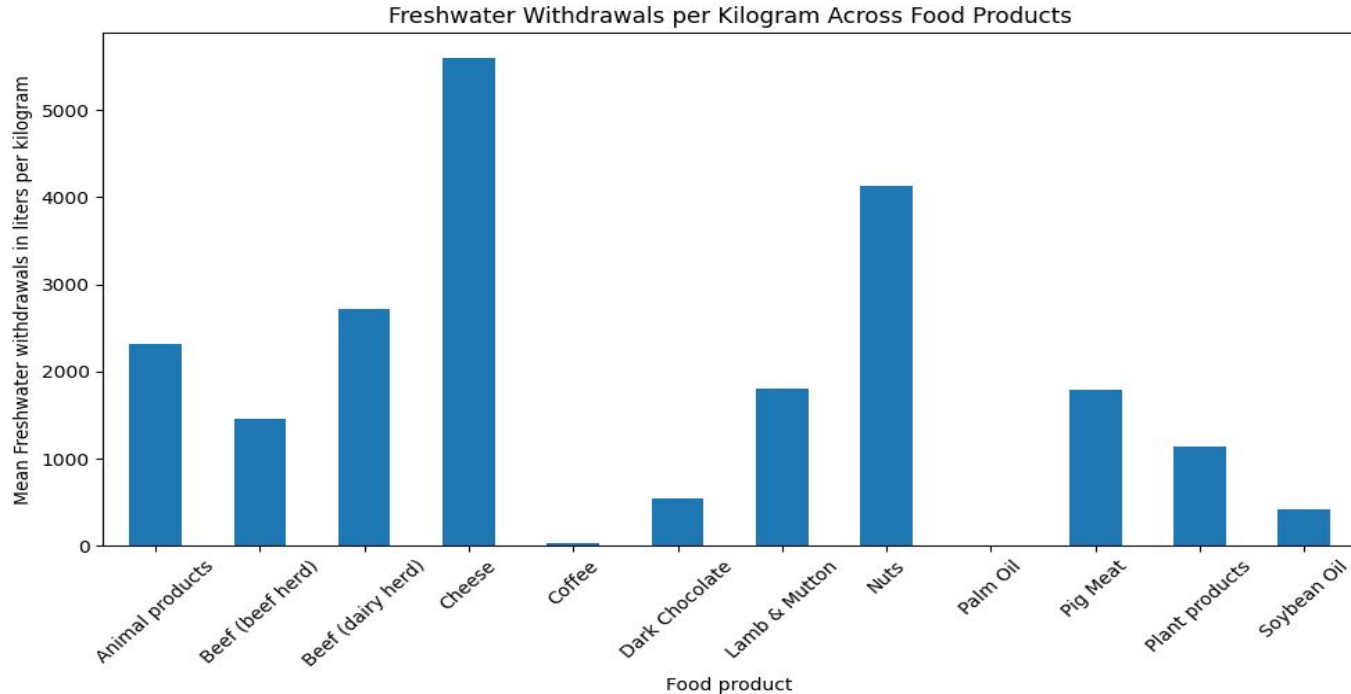
**5**. Based in the **water-scarcity** information available, what agricultural projects would we advise the IDB (Inter American development bank) to finance (funding) in our listed countries?

| | Country | Code | Year | water_stress_level |
|---|---|---|---|---|
| **20** | Brazil | BRA | 2020 | 1.48 |
| **41** | Colombia | COL | 2020 | 4.36 |
| **50** | Costa Rica | CRI | 2020 | 5.35 |
| **71** | Mexico | MEX | 2020 | 44.82 |

Considering the water stress levels and **Freshwater withdrawals per kilogram** for our listed countries

**Brazil, Colombia and Costa Rica** should be able to **receive funding** for all projects,
Vs
**Mexico we would not advise investing in** projects working with **nuts, beef and cheese production**

# Conclusion

Our methodology allowed us to effectively discriminate between the projects proposed to our client.

Brazil, Colombia and Costa Rica are apt to receive funding for projects working with all products

**+**

On the other hand, we ruled out any Mexican projects related to Nuts, Beef and Cheese production.

**→**

**Environmental Impact markers are useful when assessing the risks of agricultural projects.**

Nonetheless, a word of caution is necessary, as evaluating using only one or too little offers a very limited view of a system that is interconnected

# Questions?

THANKS !