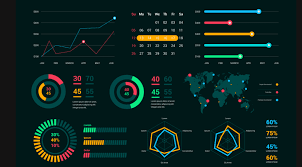
# **Process Book – Draft**

**Project Title:**  
**Exploring Agricultural Producer Protection and Nutrient Balances (OECD Data Visualization Project)**

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## ****Table of Contents****

* Introduction.....................................................................................................................2
* Dataset Description.........................................................................................................2
* Data Preparation..............................................................................................................3
* Visualization Design.......................................................................................................3
* Work Progress & Contributions......................................................................................4
* Next Steps........................................................................................................................4
* Limitations & Challenges................................................................................................4
* References.......................................................................................................................5

## ****Introduction****

Agriculture is a critical sector that ensures food supply while influencing the economy and the environment. Governmental policies like **Producer Price Protection** directly affect farming behaviors and can lead to unintended environmental consequences. This project analyzes the **Producer Nominal Protection Coefficient (NPC)** in combination with **Nitrogen and Phosphorus nutrient surpluses,** aiming to provide insights into both **economic support policies** and **environmental impacts**.

**Objectives:**

* Identify key trends in producer price protection across selected countries.
* Visualize nitrogen and phosphorus surpluses to assess environmental risks.
* Create interactive visualizations to link economic and environmental data.

## ****Dataset Description****

**Source:**

* OECD Agricultural Producer and Environmental Indicators dataset.
* File provided: OECD.TAD.ARP,DSD\_AGRI\_ENV@DF\_AEI,1.0+.A......csv.

**Key Variables:**

* **REF\_AREA:** Country code (ex: AUS = Australia)
* **TIME\_PERIOD:** Year of observation (2012–2023 focus)
* **NUTRIENTS:** Type of nutrient (NITROGEN, PHOSPHORUS)
* **MEASURE:** Type of measurement (SURPLUS, INPUT, OUTPUT)
* **OBS\_VALUE:** The numeric value of the indicator
* **UNIT\_MEASURE:** Unit of measurement

**Why this dataset?**

* It combines policy-oriented data (producer protection) with environmental indicators (nutrient surpluses).
* OECD provides standardized and reliable data across multiple countries, reducing the complexity of harmonization.

**Data Coverage:**

* Countries: All OECD members + some partner countries.
* Years: 2012 to 2023.
* Indicators: Nitrogen surplus and phosphorus surplus (primary focus).

**[Placeholder for a screenshot of dataset head/tables.]**

## ****Data Preparation****

**Steps Taken:**

1. **Loading:** Imported CSV (53,000+ rows, 30 columns).
2. **Filtering:** Focused on nutrient surplus data for nitrogen and phosphorus, keeping 2012–2023 records.
3. **Cleaning:**
   * Removed metadata columns (French names, unused fields).
   * Converted units to **kg/ha** where applicable.
   * Fixed country code mismatches for visualizations (for example, mapping REF\_AREA codes to country names).
4. **Missing Data:**
   * Identified gaps in data (for example, missing phosphorus data for some countries).
   * Decided to display gaps clearly rather than fill them.
5. **Output:**
   * Created cleaned\_dataset.csv for visualization.

**[Placeholder for data cleaning workflow diagram and summary table.]**

## ****Visualization Design****

We planned **four main charts**:

### ****1. Time Series Plot (Line Chart)****

* **Goal:** Show trends in NPC (Producer Nominal Protection Coefficient) over time.
* **Design Notes:** Multi-country selection, clear axis labels, hover tooltips.

### ****2. Choropleth Map****

* **Goal:** Display nutrient surplus (Nitrogen/Phosphorus) by country.
* **Design Notes:** Year slider, color scale (low-to-high surplus), tooltips.

### ****3. Scatter/Bubble Plot****

* **Goal:** Explore correlation between Nitrogen and Phosphorus surplus.
* **Design Notes:** Bubble size = livestock density (if available); color = region.

### ****4. Bar/Box Plot****

* **Goal:** Compare nutrient surplus across regions or income groups.
* **Design Notes:** Box plot for median and distribution; alternative grouped bar chart.

**Design Iterations:**

* Initial sketches by Nguyễn Minh Đăng and Nguyễn Xuân Duy Thái.
* Early prototypes built with Plotly (Python).

**[Placeholder for sketches and chart mockups.]**

## ****Work Progress & Contributions****

**Since Standup 1:**

* Clean dataset created and reviewed.
* Drafts of line chart, map, and scatter chart completed.
* Process Book introduction and data sections written.
* D3.js template prepared for interactive website.

**Team Contributions:**

* **Nguyễn Minh Đăng:** Focused on data cleaning, first line and map charts, coding in Python/Plotly.
* **Nguyễn Xuân Duy Thái:** Focused on checking dataset quality, sketches, D3/HTML layout, and writing key variables section.

## ****Next Steps****

* Finalize and polish the **choropleth map** (color scale, interactivity).
* Add region filters and year selectors to all charts.
* Complete box/bar plots and integrate all charts into the website.
* Expand the Process Book with evidence (data cleaning screenshots, user testing results).
* Conduct informal user testing and record insights.

## ****Limitations & Challenges****

* **Data gaps** for some countries, especially for phosphorus surplus.
* **Unit inconsistencies** (indexes, percentages, kg/ha) required extra processing.
* Time constraints for coding D3 interactivity (ongoing).

## ****References****

* OECD. (2025). Agricultural Producer and Environmental Indicators. Retrieved from <https://stats.oecd.org/>.