

Making sense of the DALRRD Daily Commodity Prices

**agriculture, land reform
& rural development**

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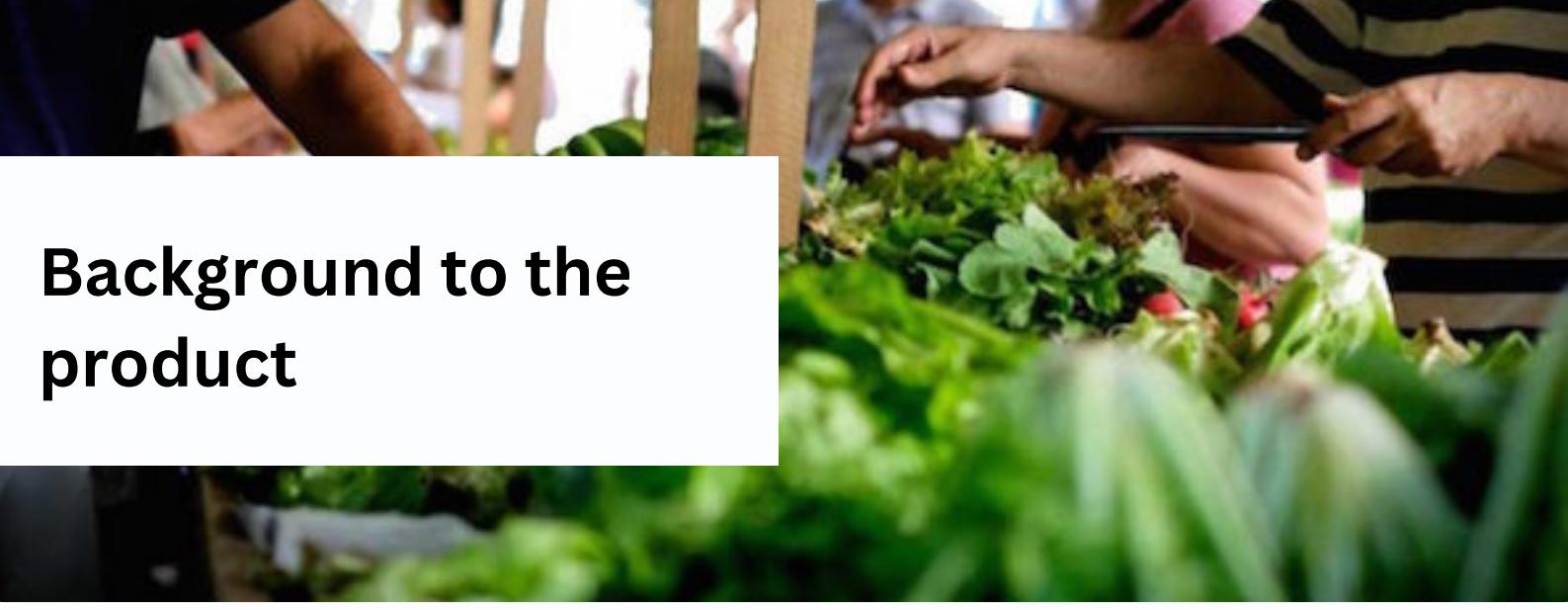




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Background to the product



The South African Department of Agriculture, Land Reform & Rural Development (DALRRD) aims to achieve equitable access to land, integrated rural development, sustainable agriculture, and food security for all.

One of the crucial components for realizing this vision is the implementation of an effective agricultural marketing information system (AMIS). AMIS plays a vital role in providing valuable data and insights, particularly through its collection of daily commodity prices in the horticulture, grain, and livestock sectors.

The information available through AMIS encompasses various aspects related to commodities, including statistics, market metadata, and pricing details. This data is utilized by both buyers (e.g., retailers) and sellers (farmers) to determine and negotiate prices on any given day.

three main categories of data within AMIS are as follows:

- Horticulture: This category provides information on the number of cabbages sold in specific markets on specific days, along with price statistics and relevant market metadata.



- Grain: The grain category offers insights into bids, the number of deals, and contracts for soybeans in different markets, along with corresponding market metadata.
- Livestock: The livestock category presents aggregated data at a national level, including the total number, mass, and average price of cattle on a weekly basis

Presently, the data within AMIS is dispersed across different websites, following various data structures and time periods. Additionally, the livestock data is available only in PDF format, while horticulture and grain data can be extracted in XLS format. However, the horticulture data is limited to the past 90 days and is presented in a format primarily designed for printing spreadsheets.

This white paper outlines a project aimed at automating the scraping and transformation of the three commodity price categories within DALRRD's AMIS system. The primary objective is to develop a comprehensive dashboard that incorporates essential exploratory data analysis (EDA) principles.

The resulting dashboard will provide relevant and useful figures, statistics, trends, forecasts, and regional differences to facilitate informed decision-making and enhance market transparency.

Problem Overview



The problem that our project aims to solve is the lack of a centralized and easily accessible source of daily commodity prices for horticulture, grain, and livestock in South Africa.

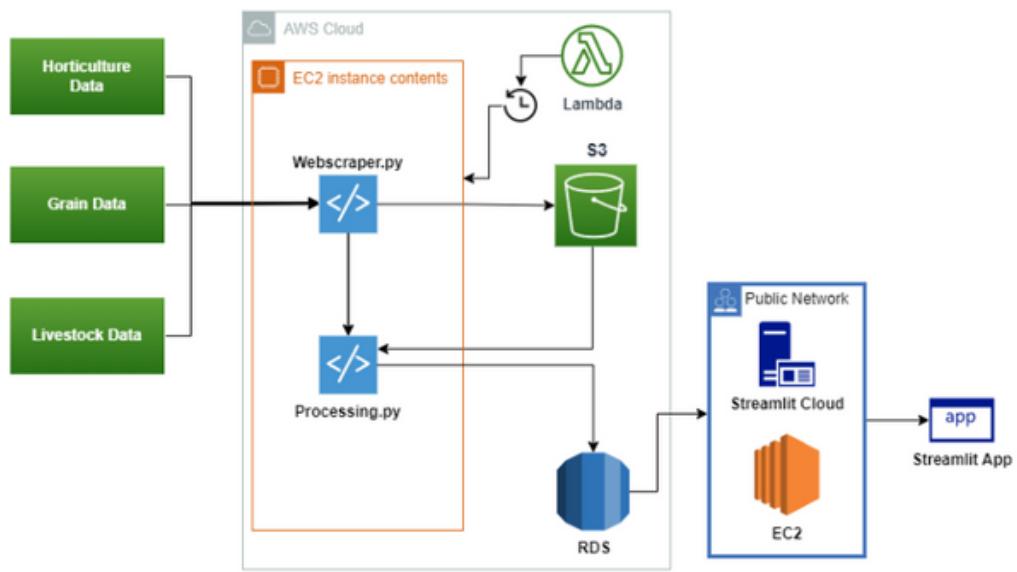
Currently, this information is scattered across various websites and presented in different formats, making it difficult for buyers and sellers to access and analyze the data effectively. Therefore, aiming to automate the collection, scraping, and transformation of this data into a single dashboard that presents relevant statistics and figures in an accessible and user-friendly way.

By providing a centralized and reliable source of commodity prices will encourage buyers and sellers to make informed decisions and contribute to the sustainable development of the agriculture sector in South Africa.

Solution



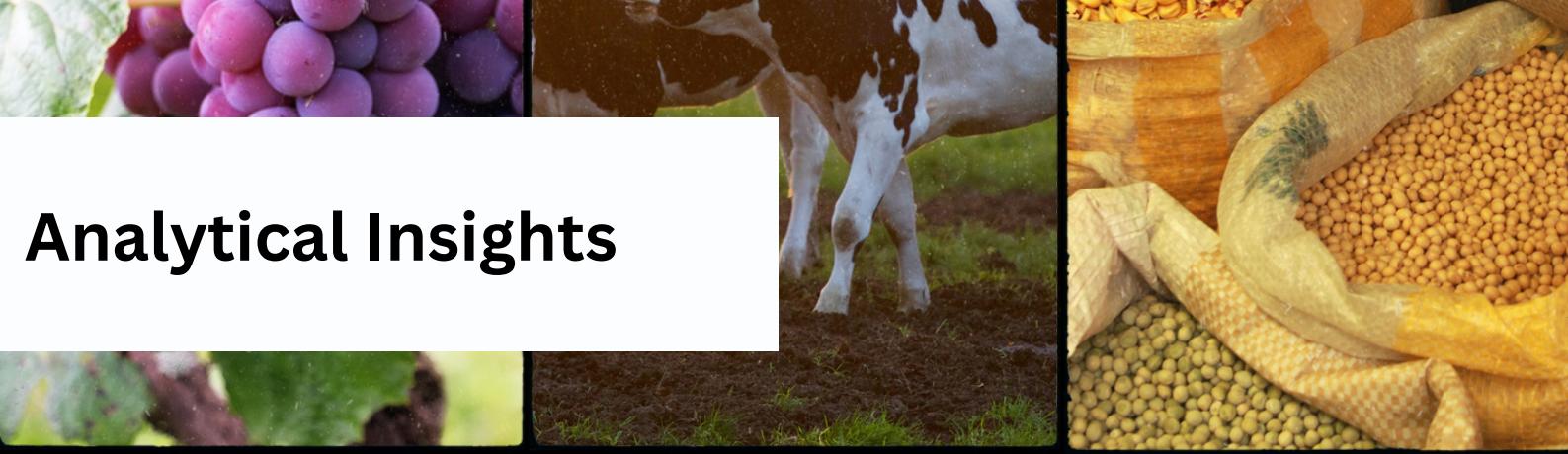
An architectural overview of the solution is outlined in the figure below, a task-by-task step from web scraping and processing scripts hosted in the Amazon Web Services (AWS) and relative database, all the way to streamlit app:



Solution to the problem of scattered and inaccessible daily commodity prices for horticulture, grain, and livestock in South Africa is to develop an Agricultural Marketing Information System (AMIS) dashboard that:

- Automates the collection, scraping, and transformation of this data into a single dashboard.
- Presents relevant statistics and figures in an accessible and user-friendly way.
- Applies solid EDA principles to ensure the dashboard provides useful and relevant insights.

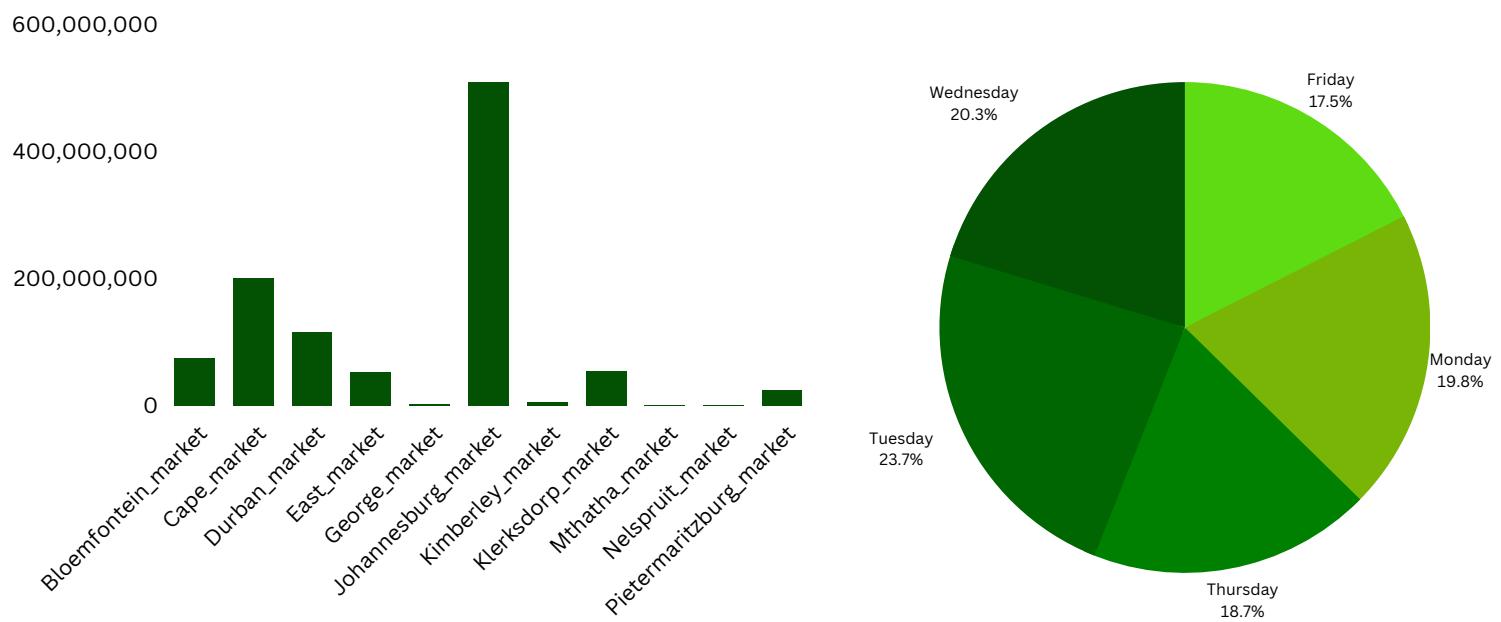
Analytical Insights



HORTICULTURE:

The analysis of the horticulture data yielded valuable insights, some of which are outlined below:

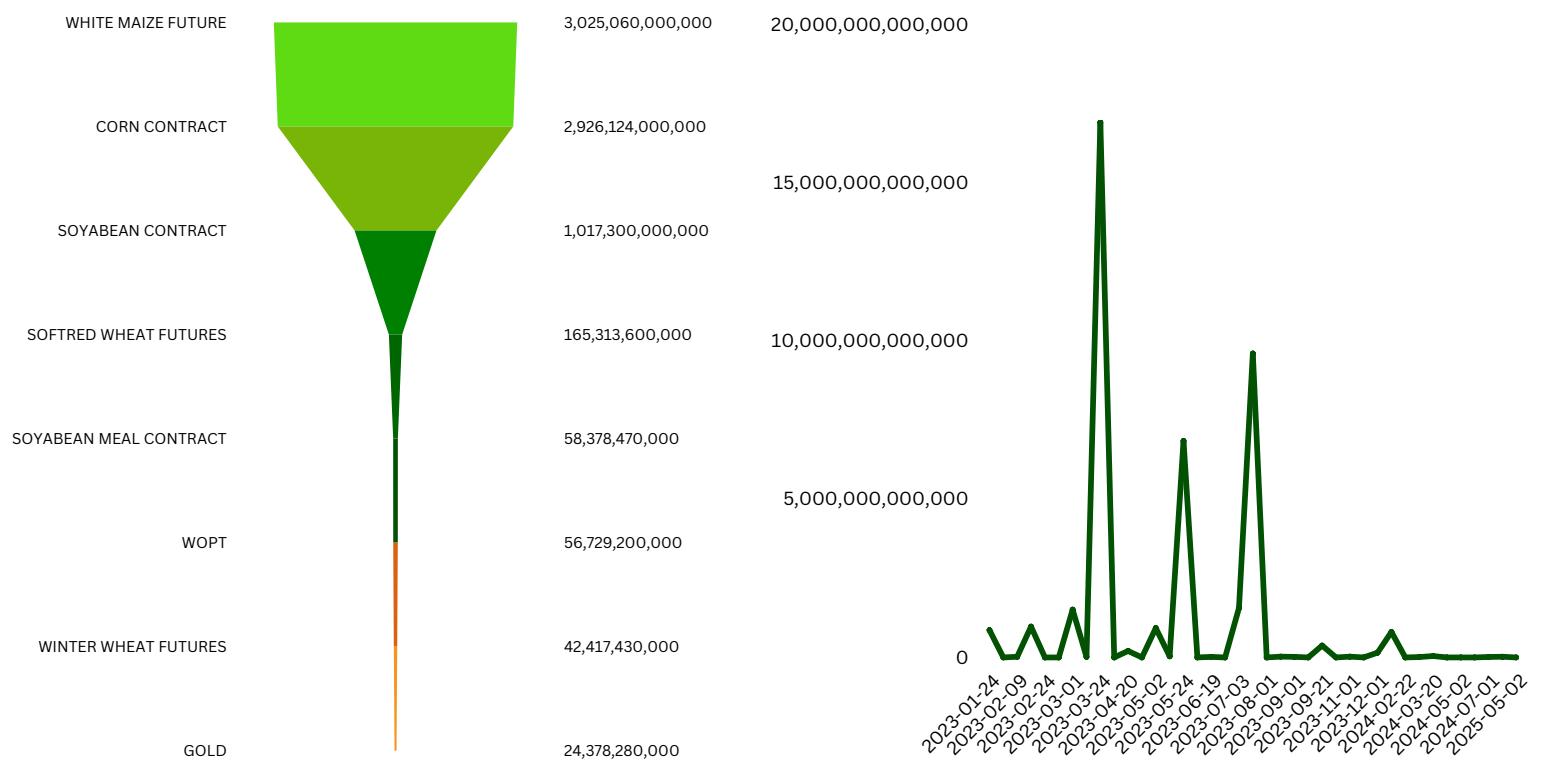
1. Most Popular Markets: Our analysis covered approximately 50 different markets that specialize in selling horticulture produce. Among these markets, it was observed that the Johannesburg Market and the Cape Market were the most popular.
2. Busiest Days: The data revealed that Tuesdays are generally the busiest days in these horticulture markets. On Tuesdays, there was a significant influx of buyers, accounting for approximately 23.7% of the total purchases. Other weekdays also exhibited considerable activity which indicates a relatively even distribution of buyer activity throughout the weekdays.



GRAIN:

The analysis of the grain dataset provided valuable insights into the offers and bids made on various grain products. Some of the key findings from the analysis are as follows:

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- Most Offered Grains: The data revealed that white maize and corn were the grains with the highest number of offers. This finding aligns with the fact that maize is one of the leading crops produced in South Africa. On average, approximately 18 million tons of maize are harvested in the country each year. The popularity of white maize and corn in the grain market indicates their significant presence and demand within the agricultural sector.
- Price Trend Analysis: During the analysis, the price trends over time were examined. Notable spikes indicating high sales were observed around March 7 and March 24, 2023. These spikes suggest increased market activity and potentially higher demand for grain during those specific periods. Further investigation into the factors influencing these spikes, such as weather conditions, market events, or economic factors, can provide a deeper understanding of the grain market dynamics.

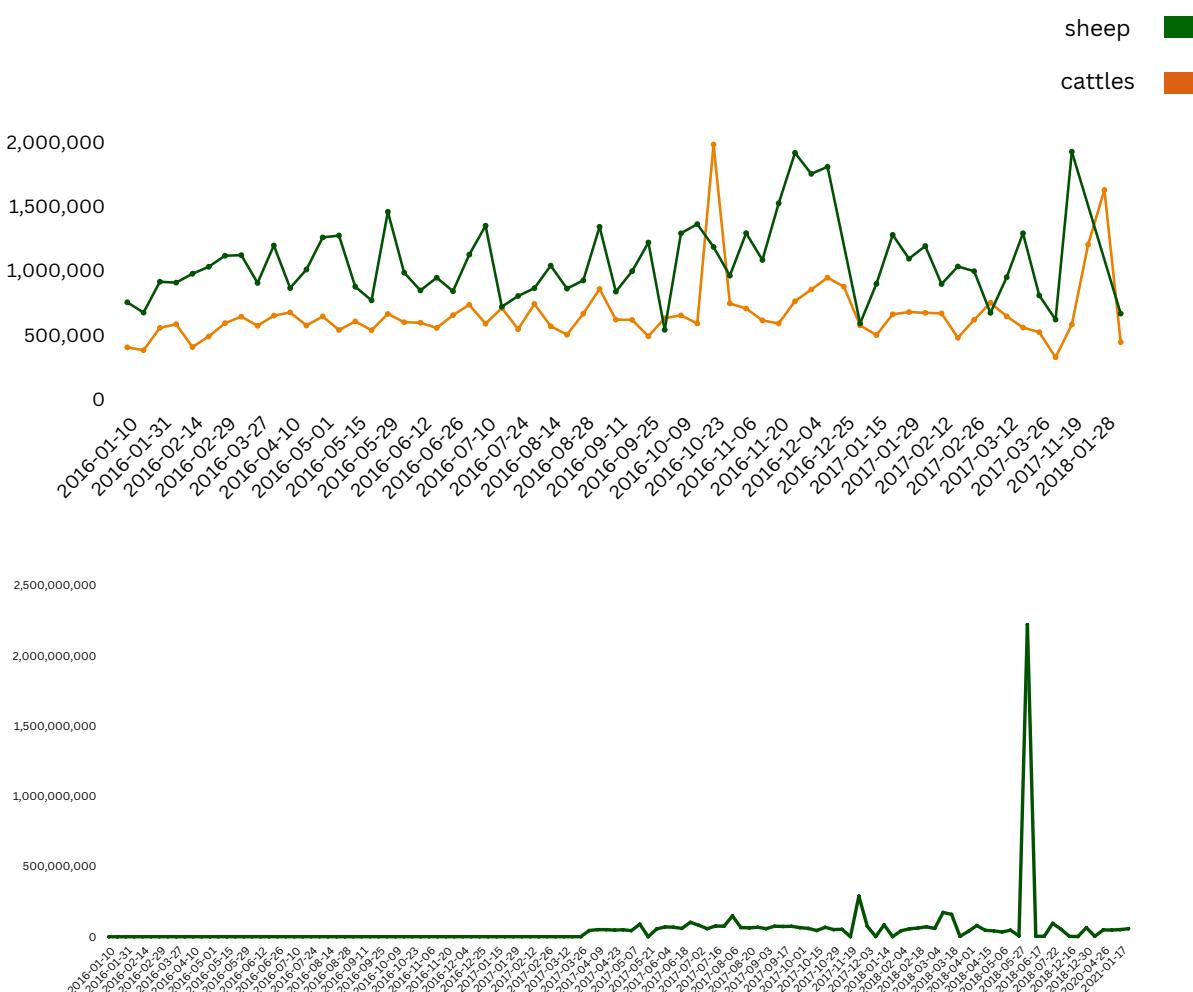


LIVESTOCK:

The analysis of the livestock data, specifically focusing on sheep, cattle, and pigs, revealed interesting insights regarding sales trends. These insights are summarized below:

- Sheep and Cattle Sales: The data exhibited an intriguing spike in sales during the later part of 2016 and 2017 for both sheep and cattle. This spike indicates a period of increased market activity and potentially higher demand for these livestock during that specific timeframe.
- Pig Sales: In the pig market, an interesting spike in sales was observed around May 2018. This indicates a surge in market activity and potentially higher demand for pigs during that particular period.

Analyzing the circumstances surrounding this spike, such as market events, supply and demand factors, or specific industry developments, can help in comprehending the drivers behind this sales increase.



Conclusion



The automation of the scraping and transformation of South Africa DALRRD's commodity prices from the horticulture, grain, and livestock categories into a comprehensive dashboard presents a powerful solution for enhancing market transparency and facilitating informed decision-making. By consolidating and visualizing the data, stakeholders can gain valuable insights into historical trends, regional variations, and forecasting, thus empowering them to make data-driven decisions in the agricultural sector.

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