Analysis Report – Kerala Market Price Analysis

File: Reports/Analysis_Report.pdf
Project: Kerala Market Price Dashboard
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Dataset: Variety-wise Daily Market Prices Data of Commodity(Kerala-KNR)

1. Project Overview

This project analyzes Kerala's commodity market pricing using a large dataset containing arrival information, market names, commodity types, varieties, grades, and three key price points: **Min Price, Max Price, and Modal Price**.

The goal of this dashboard is to provide insights into:

- Commodity price trends
- Market-wise price variations
- Modal price stability over time
- Price volatility across commodities
- Commodity distribution
- Key performance metrics (Total Markets, Total Commodities, Total Records, Price Aggregations)

The dashboard allows users to interact using filters such as **Arrival Date, Market, Commodity, Grade, and Variety**.

2. Dataset Summary

Dataset Size

- **Total Rows:** 146,900+
- **Total Columns:** 10

Columns Included

- State
- District
- Market
- Commodity
- Variety
- Grade
- Arrival_Date
- Min_Price
- Max_Price
- Modal_Price

Key Characteristics

- Contains multi-year data across Kerala markets
- Includes daily or monthly arrival records
- Prices vary significantly between commodities
- Modal price provides a stable reference point

Cleaning Steps

- Removed duplicates
- Converted Arrival_Date to proper date format
- Standardized Market, Commodity, and Variety names
- Ensured numeric fields (Min, Max, Modal) contain valid values

3. Column-wise Assessment Summary

Column Name	Type	Observations	Cleaning Notes
State	Categorical	All values = Kerala	OK
District	Categorical	Multiple districts	No cleaning required
Market	Categorical	18 distinct markets	OK
Commodity	Categorical	54 commodities	OK
Variety	Categorical	Varied text values	Standardized
Grade	Categorical	Mostly "FAQ"	OK
Arrival_Date	Date	Multi-year range	Converted to date format
Min_Price	Numeric	Some low/high values	Valid
Max_Price	Numeric	High variance	Valid
Modal_Price	Numeric	Used for stability	Valid

4. Data Model Overview

Tables Used

- **Market Sales Data (Single Fact Table)**

Relationships

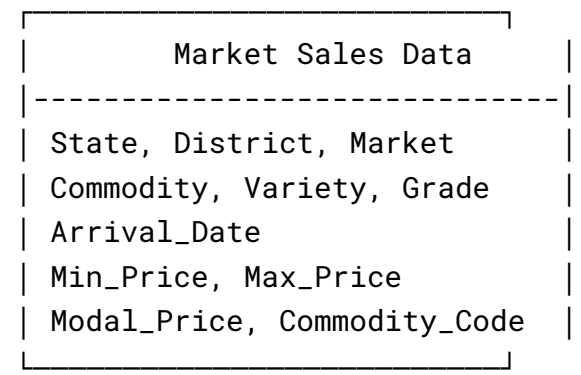
- This dashboard uses **only one table**, so no relationships exist.

Key Calculations / Measures

- Total Min Price
- Total Max Price
- Total Modal Price
- Total Markets

- Total Commodities
- Total Records
- Average Modal Price
- Price Difference
- Price Volatility %
- Rank Commodity
- Selected Commodity Price

Data Model Diagram



5. Analysis & Insights

1. KPI Analysis

- **Total Records:** 146.9K
- **Total Markets:** 18
- **Total Commodities:** 54
- **Total Min Price:** 19.5M+
- **Total Max Price:** 20.2M+
- **Total Modal Price:** 19.9M

These values indicate a **large and diverse dataset** with wide price variations.

2. Top Commodities by Average Modal Price

(From the bar chart)

- Black pepper leads with **47K avg modal price**
- Pepper ungarbled: **34K**
- Pepper garbled: **30K**
- Arecanut (Betelnut/Supari): **26K**
- Coconut Oil: **15K**

Insight:
Spices dominate Kerala's commodity pricing with extremely high modal prices.

3. Modal Price Trend Over Time

(From the line graph)

- Large fluctuations from 2009–2024
- 2012, 2018, and 2021 show major price spikes
- 2016 had a noticeable drop
- 2022–2024 shows moderate fluctuation but still unstable

Insight:
Commodity prices are **highly seasonal** and **market-driven**, with occasional extreme highs.

4. Max vs Min Price Comparison

(Top 7 shown)

- Black pepper has the highest Max and Min totals
- Arecanut, Coconut Oil, Rubber follow
- Significant gaps between Max and Min indicate **price volatility**

Insight:
Most top commodities experience **large price gaps**, showing unstable market patterns.

5. Commodity Distribution (Donut Chart)

- Black pepper: **34%**
- Coconut Oil: **24%**
- Arecanut: **21%**
- Rubber: **13%**
- Pepper ungarbled: **3%**
- Pepper garbled: **3%**
- Cashewnuts: **1%**

Insight:
Three commodities make up nearly **80%** of total entries.

6. Price Stability (Volatility %)

(From the stability chart)

- Arecanut shows **167% volatility** → Very unstable
- Black pepper: **93%**
- Pepper garbled: **84%**
- Coconut Oil: **77%**
- Rubber: **56%**
- Pepper ungarbled: **48%**
- Cashewnuts: **21%** → Most stable

Insight:
Price volatility is extremely high for many commodities, indicating unpredictable markets.

7. Detailed Table Insights

- Yearly grouping shows seasonal patterns
- Months like January, July, and November show higher price activity

- Rubber and Coconut Oil have consistent year-round records
- Sum of prices shows large cumulative values for Black Pepper and Arecanut

6. Conclusions

- Kerala's commodity markets show **high price variation** across different commodities.
- Modal prices reveal a clear dominance of spices (Pepper, Arecanut).
- Historical price trends indicate **frequent spikes**, possibly due to seasonal supply.
- Price volatility is extremely high for some commodities, increasing risk for traders.
- Market-level data provides strong insight into regional pricing dynamics.

7. Recommendations

- **Monitor volatile commodities** (Arecanut, Pepper) regularly.
- **Use seasonal forecasting models** to predict spikes.
- **Build commodity-level alerts** for unusual price movements.
- **Develop separate dashboards** for:
    - District-level comparison
    - Market affordability
    - Commodity category analysis
- Improve data quality by including **quantity/volume** columns.

8. Dashboard Overview

Sections Included

- KPI Summary
- Average Price by Commodity (Top 12)

- Modal Price Time Trend
- Max vs Min Comparison (Top 7)
- Commodity Distribution
- Price Stability %
- Detailed Price Table

Filters Available

- Arrival Date
- Market
- Commodity
- Grade
- Variety

Navigation

- Dark background theme
- High-contrast charts
- Intuitive slicer panel on left
- Clear labeling and value formatting

9. Notes / Limitations

- Dataset contains **only price information**, not quantities.
- Missing values in some fields limit deeper statistical modeling.
- Single-table model restricts advanced star-schema analytics.
- Long date ranges require careful trend interpretation.