# DATA MINING TECHNIQUES FOR THE EFFECTIVE AGRICULTURAL MARKETING IN VELLORE DISTRICT, TAMIL NADU

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**Abstract:**

Data Mining plays a significant role in changing the agricultural marketing strategy. DMTAM tools are transforming the agriculture industry with game-changing agricultural information solutions and market intelligence that enable farmers, agribusiness and commodity traders to actively and effectively manage their businesses. DMTAM has the new and increasingly innovative application in agriculture and leads the agro industry with insightful, independent content and in-depth market analysis. The integrated Agro-based business data mining tools empower better on-farm decision making. Staying on top of everything has never been easier. This has made a noticeable impact of the current socio-economic condition of farmers of the rural areas. This paper aims to study the application of Data Mining Techniques in analyzing agricultural marketing data and its impact on the development of Agricultural Marketing.

*Key words: Data mining, Data Network, DMTAM*

## 1.1 Introduction:

Agricultural marketing services involved in moving an agricultural product from the farm to the consumer. These services involve the planning, organizing, directing and handling of agricultural goods with a view to satisfy farmers, intermediaries and consumers through digital platforms. Data mining is one of the fastest growing fields in Agricultural marketing which is used to discover new marketing trends, plan agricultural investment strategies and detect unauthorized expenditure in the agricultural marketing system.

In digital era, Data Mining Techniques are used in analyzing the trends of agricultural marketing and improve marketing campaigns and the outcomes to provide buyers with more focused support and attention.

Agricultural Data Mining is the set of activities used to find new, hidden or unexpected or unusual patterns in data. Data Mining Techniques in Agricultural Marketing (DMTAM) tools are transforming the agriculture industry with game-changing agricultural information solutions and market intelligence that enable farmers, agribusiness and commodity traders to actively and effectively manage their businesses. DMTAM has the largest scope in agricultural marketing and leads the agro industry with insightful, independent content and in-depth market analysis. The integrated business data management tools empower better on-farm decision making. Staying on top of everything has never been easier.

## 1.2 Historical Development of Agricultural Data Mining:

The concept of data mining has been used by businesses for more than a century. It is not a new digital age invention. It became a great public focus in the 1930s. It first came into the Limelight when Alan Turing in 1936 introduced the universal machine concept that was able to perform computations that are similar to present-day computers. Hence it is not a new invention of the digital age. So many improvements have taken place since then. In order to improve several aspects that include sales processes, interpret financials for the purpose of investment, businesses have started machine learning, and are making use of data mining. As a result of this data scientists all over the world have become very vital for business establishments and enable them to achieve greater business goals with data science.

Agricultural Data Mining is the process of analyzing large volumes of data so as to discover business intelligence which helps farmers to solve problems, seize new opportunities, and mitigate agricultural risks. Some data mining tools used in the industry are Rapid Miner, oracle data mining, IBM SPSS Modeler, KNIME, Python Orange, Kaggle, Rattle, Weka, and Teradata. Data mining examples: include Groupon- Data mining allows Groupon alignment of marketing activities closely to customer preferences which analyze just 1 terabyte of real-time customer data that helps to identify the emerging trends. Data mining technique is used by Air France. Trip searches, bookings, social media, flight operations, call centers, and interactions in the airport lounge are analyzed and a 360-degree customer view is created. Grocery stores use data mining by giving loyalty cards to customers that make it easy for the cardholders to avail of special prices that are not made available to non-cardholders. The above are a few examples of data mining helping companies to increase efficiency, streamline operations, cost reduction, and improve profits. Hence, this research study also aims to use the data mining techniques in order to bring sustainable development in agricultural marketing.

## 1.3 Process of Agricultural Marketing Data Mining

Agricultural Marketing Data Mining can be viewed as a result of the natural evolution of information technology. An evolutionary path has been witnessed in database industry in the development of Agricultural Marketing Data Mining of the following functionalities:

➢ Agricultural Marketing Data Collection

➢ Agricultural Marketing Database Creation

➢ Agricultural Marketing Data Management

➢ Agricultural Marketing Data Analysis & Interpretations

## 1.4 Taxonomy of Agricultural Data Mining:

The agricultural marketing data mining tasks are as follows:

➢ Predictive Agricultural Marketing Data Mining Model

➢ Descriptive Agricultural Marketing Data Mining Model
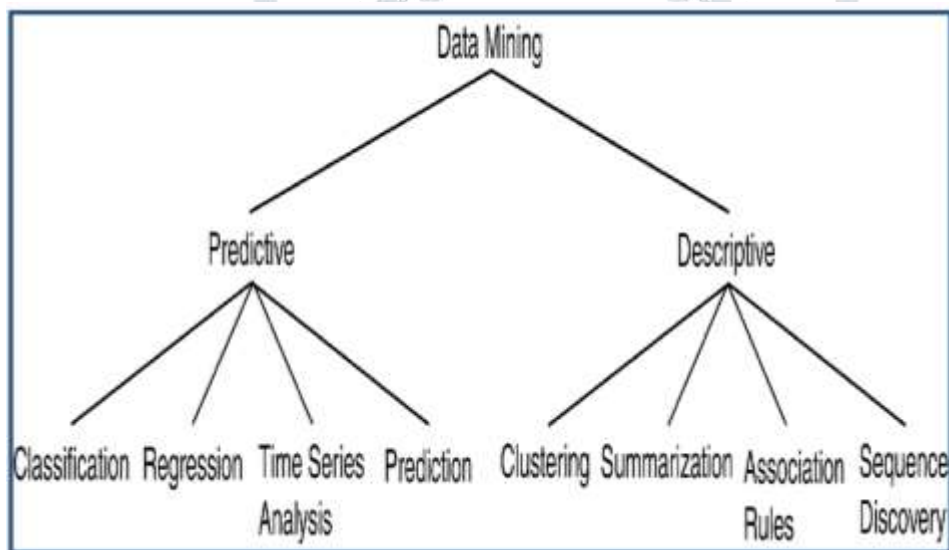


## 1.5 Technological Frontiers in Indian Agriculture:

Agriculture, one of the most vibrant sectors of the Indian economy has witnessed a gradual change over the years, which has placed it on the path of modernization. Data Mining Techniques in Agricultural Marketing concept can be implemented rapidly to develop and enhance the value of existing information resources, and can be integrated with new products and systems as farmers are brought online business. This revolution proved to be a benediction by spurring the overall growth of agricultural sector in India.

DMTAM can be used for numerous services, both for agricultural industries and for farmers. For agricultural industries, agricultural marketing data can be used for increasing their supply of agro-products and improving their products quality and productivity. For farmers, networks of agro industries can be used to forecast the demand for and price of their agro-products, weather conditions and marketing position, etc. The DMTAM techniques have resulted in several innovative tools that have helped tremendously in reducing the time and energy invested in terminal. This method has also reduced input cost and enhanced profitability.

## 1.6 Objective of the Study:

The present study examined the following broad objectives:

❖ To study the Data Mining Techniques in analyzing Agricultural Marketing trends in Vellore District, Tamil Nadu;

❖ To develop the data mining model for the effective agricultural marketing.

## 1.7 Methodology and Data Sources:

The study has conducted scientific study with relevant theoretical data. The selection of the study area and the sample has been done based in the concentration of area under DMTAM. Samples of 50 progressive farmers were selected through non-random sampling method for the in-depth study period of two years, from Jan 2019 to Dec 2020. The study expected that the findings of this paper will enable policy makers make wise decision regarding DMTAM that will benefit farmers communities. The study will create awareness among the farmers that will enhance initiatives to reduce the problems, highlighting the role of different stakeholders and extent to which they can be active in addressing it.

## 1.8 Agricultural Data Mining Network:

The field of data mining networks has evolved over the last fifteen years from a stage where networks were designed in a very ad hoc and technology – dependent manner to a stage where some broad conceptual understanding of many underlying issues now exists. DMTAM is transforming the data to the agriculture industry with game-changing agricultural information solutions and market intelligence. When such networks will become available and at what cost, but they could significantly reduce the cost of data transmission, making efficient use of transmission facilities less important.

## 1.9 Agricultural Data Mining Cost Analysis:

The cost of transmitting data on a communication link from one farmer to another has also been dropping, but at a much slower rate than computational costs. The cost of a data link increases with the available data rate but the increase is much less than linear in the data rate. Thus, the cost per transmitted

binary symbol decreases with the data rate of the link. It is after economically advantageous for the many farmers to share one high-rate data link rather than having separate data links for each.

One result of sharing high-speed communication links is that the cost of sending data from one farmer to another increases less than linearly with the geographic separation. This occurs because the communication path could include a short link to a shared long-distance, high speed link and then another short link to the destination.

## 1.10 Proposed Model and Result

For over 60% of India's population, agriculture is their major source of income. It accounts for almost sixteen percent of India's overall GDP. The technology analyses and accurately predicts the cost of agricultural data. The following diagram depicts the process model for analyses and prediction of agricultural crop price using data mining:
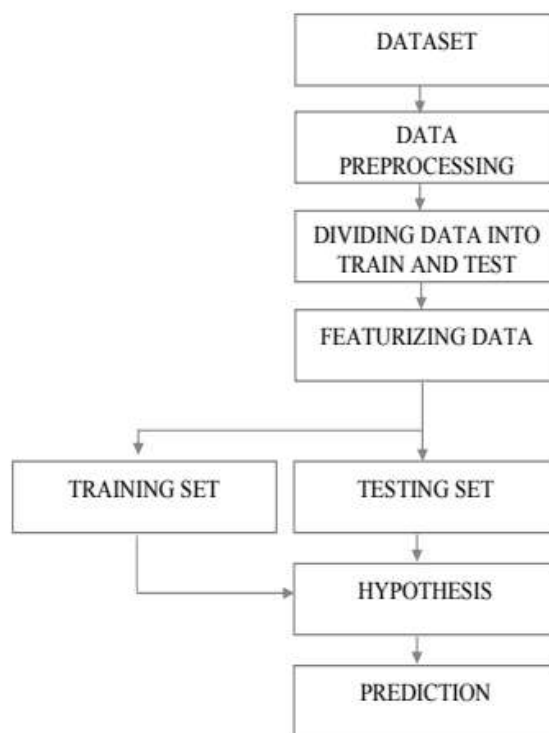


Fig.1. Flow of work

### A. Dataset

Dataset Agriculture crop prices are influenced by many various factors of agriculture parameters which are climate condition, demand for crop and supply. The data include the daily base data of several commodity of several markets of Tamil Nadu state. Collecting data with all other parameters is more difficult task hence considered only the price of various crop prices. From Tamil Nadu State some sample data are collected.

| Date | Commodity | Price | Market |
|------|-----------|-------|--------|
| 2021/12/05 | RAGI | 800 | DHARMAPURI |
| 2021/12/05 | MAIZE | 750 | ARIYALUR |
| 2021/12/05 | POTTATTO | 600 | NILGIRIS |
| 2021/12/05 | JOWAR | 740 | COIMBATORE |
| 2021/12/05 | BAJRA | 1100 | RAMANATHAPURAM |
| 2021/12/05 | GROUNDNUT | 1850 | THIRUVANNAMALAI |

- Price is the target variable,
- Date is the time series variable,
- Market and Commodity are categorical variables.

## B. Data Pre-processing

Pre-processing of the raw and random data gathered is required in order to make the data appropriate for future study.

## C. Data Featurization

Featurization include conversion of categorical into numerical data using techniques of data mining.

## D. Hypothesis

It is a pre-trained model with 70% data which we call hypothesis.

## E. Predicting the price

The crop price is used as an input, along with year, month, day, commodity name, and market. The price of the crop may therefore be forecasted using a dataset by utilising an algorithm.

## 1.11 Suggestions and Recommendations of the study:

The following are suggestions and recommendations of the study:

- ❖ Before DMTAM are examined, a brief overview will be given, first, of the technological and economic factors that have led to network development, and, second, of the applications that require networks.
- ❖ DMTAM should be performed for the benefits of both farmers and agro-industrialists and empower better on-farm decision making and agro-products.

**1.12 Scope for further study:**

- ❖ DMTAM link control and communication channels
- ❖ Delay models in DMTAM
- ❖ Routing in DMTAM
- ❖ DMTAM Flow control and
- ❖ DMTAM security and connectivity

**1.13 Conclusions:**

Agriculture has always been the backbone of the Indian economy. Agricultural trends have been under doing a constant change with the rapid developments and advancements in agriculture techniques. Modern day Agricultural technology has the potential for important efficiency in all sphere of agriculture. When used appropriately DMTAM provides a great advantage over farmers and allows a agro-marketing to determine the trend of customers to develop marketing strategies that are effective in bringing down costs and boost up agricultural revenue.

**1.14 Acknowledgements:**

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