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Declaration

I, **Kinshuk Jaiswal**, student of **MBA 2014-16** of Delhi School of Management, Delhi Technological University, Bawana Road, Delhi – 42, hereby declare that the dissertation report “**Agricultural Marketing Information System Network: A Gap Analysis for Maize**” submitted in partial fulfillment of Degree of Masters of Business Administration is the original work conducted by me.

The information and data given in the report is authentic to the best of my knowledge.

This report is not being submitted to any other University, for award of any other Degree, Diploma or Fellowship.

Kinshuk Jaiswal

Place:

Date:

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Kinshuk Jaiswal

Abstract

The AGMARKNET portal is an initiative taken by the Department of Marketing and Inspection, Ministry of Agriculture, Government of India, with the aim of collecting and disseminating marketing related information of agricultural commodities throughout the country, as well as farmers' welfare. This information is highly crucial in nature as it can be used by various stakeholders, such as farmers, traders and policy makers among others, to make important decisions at individual as well as national level. It also aims to strengthen the economic position of farmers as well as consumers by providing them with marketing related information of agricultural commodities spanning over all the markets in the country. Such information will enable the farmers to obtain fair returns on their produce. For consumers, it means that they will be able to obtain agricultural produce at fair and affordable prices.

To achieve these objectives, it is necessary that the information being recorded and disseminated by the AGMARKNET portal be of accurate and reliable nature. The fact that this information is also intended to be used for national level agricultural policy decisions, makes it even more crucial for the information to be highly accurate and complete in all aspects.

This study aims to analyze the daily market data reported on the AGMARKNET portal, regarding the non-perishable agricultural commodity Maize, over a period of time and test the data in terms of quality, correctness, accuracy and reliability. Various techniques have been used to analyze the data and establish the various types of anomalies that may or may not exist in the data. The study also aims to establish whether the original intention of the AGMARKNET initiative of uploading accurate market related data timely and regularly, is being fulfilled, and establish the defaulters in the process, if any.

The activity involved daily collection of data of prices and arrivals of all the markets in the country from the AGMARKNET portal regarding the non – perishable commodity Maize. The data collection was repeated after a pre-defined period of

time to identify deficiencies and verify the various evaluation parameters. MySQL Database Server and Microsoft Excel have been used as analysis tools in this study.

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List of Abbreviations

AGMARKNET	Agricultural Marketing Information Network
AMA	Agricultural Marketing Adviser (to the Govt. of India)
APMCS	APMCS (Agricultural Produce Market Committees)
DMI	Directorate of Marketing and Inspection
EDP	electronic data processing (EDP)
FAO	Food and Agriculture Organization
GNU	GNU (operating system) is Not Unix (recursive abbreviation)
GPL	(GNU) General Public License
IADP	Intensive Agricultural Development Programme
ICT	Information and Communication Technology
IFFCO	Indian Farmers Fertilizer Cooperative Limited
MCX	Multi Commodity Exchange of India
NCDEX	National Commodity & Derivatives Exchange
NGO	Non-governmental Organization
NIC	National Informatics Centre
NMCE	National Multi Commodity Exchange of India Ltd.
OS	Operating System
SMS	Short Message Service
SQL	Sequential Query Language
WHO	World Health Organization (WHO)

Chapter 1

Introduction

1.1 Introduction to the project

1.1.1 Background

Agricultural marketing in India has come a long way since independence, but still many challenges are present. Market information could be considered as a crucial factors for farmers in order to plan production and marketing of the produce. Other market participants also require market information in order to make decisions related to trading. Thus it was highly essential that the marketing information is accurate and complete in all aspects, and is efficiently disseminated to the stakeholders. With the advent of Information and Communication Technology (ICT), it became easier to communicate large volumes of data to far and remote locations. Thus in order to strengthen the farming communities and to provide them with opportunities of trade, there was a need to implement a solution providing “Agricultural Marketing Information Network” in the country.

As a result, the Central Sector Scheme project of Agricultural Marketing Information Network (AGMARKNET) was launched by the Ministry of Agriculture, Government of India in the month of March, 2000. It aimed to connect together all the agricultural produce wholesale markets throughout the country and the State Agricultural Marketing Boards and Directorates. The project received technical support from National Informatics Centre (NIC).

Till date, a total of 3245 nodes have been affiliated with the scheme. These nodes comprise of agricultural produce markets, field offices of Directorate of Marketing and Inspection and State Agricultural Marketing Boards/ Directorates and their attached offices, etc. These nodes have been provided with necessary computer hardware components along with internet connectivity. ‘AGMARK,’ a user friendly software package has been developed to facilitate compilation and transmission of data at market level. The reporting system is now web-enabled. The

AGMARKNET portal (<http://AGMARKNET.dac.gov.in/>) strengthens interface with farmers and other beneficiaries. The AGMARKNET portal also provides access to various websites of organizations involved with agricultural marketing. It provides weekly trend analysis, futures prices and international price trends for important commodities.

1.1.2 Directorate of Marketing and Inspection

The Directorate of Marketing and Inspection (DMI) is under the Ministry of Agriculture and Farmers Welfare, Government of India. The Government of India had setup the DMI in the year 1935 to facilitate the implementation of agricultural marketing policies and programmes. Since then the Directorate has been working tirelessly to bring about advancement of agricultural marketing as well as safeguarding the interests of producers, suppliers as well as consumers. It also facilitates interaction between the Central and State Governments regarding agricultural marketing policies. The Directorate is headed by the Agricultural Marketing Adviser to the Govt. of India (AMA).

1.1.3 National Informatics Centre (NIC)

The National Informatics Centre (NIC) was established in 1976 to provide ICT Solutions for effective e-Governance initiatives. National Informatics Centre has spearheaded the "Informatics-led-development" programme of the Government of India and has generated competitive advantage by implementing ICT applications in social & public administration. The following major activities are being undertaken:

- Setting up of ICT Infrastructure
- Implementation of National and State Level e-Governance Projects
- Products and Services
- Consultancy to the government departments
- Research and Development
- Capacity Building

Since its inception, NIC has undertaken many software application implementations based on state-of-the-art technology. NIC is also responsible for managing the information systems and websites of Central Ministries/Departments, Disaster Recovery Centres, and Network Operations facility to manage heterogeneous networks spread across Bhawans, States and Districts, Certifying Authority, Video-Conferencing and capacity building across the country. NIC also has under its belt various initiatives such as Government eProcurement System (GePNIC), Office Management Software (eOffice), Hospital Management System (eHospital), Government Financial Accounting Information System (eLekha), etc.

For the Agricultural Marketing Network Scheme, NIC had provided computer hardware, developed the software, provided training to market personnel towards the operation of the hardware and software systems and provided internet connectivity. It has also developed the integration between the software packages developed by the various states with AGMARKNET to bring about seamless uniformity in the database.

1.1.4 State Agricultural Marketing Boards

Ever since the country attained independence, the Planning Commission of India has been striving hard to maximize agricultural production. In pursuit of this goal, the Zamindari system had to be abolished and surplus land had to be distributed among farmers and laborers. The programmes like Intensive Agricultural Development Programme (IADP) were launched. Rural development became of prime importance. So, on one hand, on the national level, efforts were being made to maximize production, while on the state level, the focus was laid on sale, storage and processing of agricultural produce. There was also the issue of distribution of the produce so that the produce was sold off at prices which were to be fair to both farmers, traders and consumers. It was with this objective in view that many states chose to establish State Agricultural Marketing Boards in order to facilitate marketing activities regarding agricultural produce.

For AGMARKNET, the State Government/ Marketing Boards provided the list of markets to be covered under the Agricultural Marketing Scheme. The selected markets were to provide site for installation comprising facilities for computer installation, telephone connectivity and computer operator.

Market Committees/ Controlling authorities of AGMARKNET node at market level were assigned to collect relevant data and information, feed it and transmit it to the State level and AGMARKNET portal. NIC had also trained suitable persons from each node in operating computer and handling software package.

At each market node, there is a person assigned to collect data and transmit it. An incentive scheme has been introduced to reward data entry operators for maintaining performance standards regularly.

1.2 Significance of the study

As a step towards globalization of agriculture, the Directorate of Marketing & Inspection (OMI) has embarked upon an ICT project: NICNET based Agricultural Marketing Information System Network (AGMARKNET)" in the country, during the Ninth Plan, for linking all-important APMCS (Agricultural Produce Market Committees), State Agricultural marketing Boards / Directorates and OMI regional offices located throughout the country, for effective information exchange on market prices NIC implements this project on a turn-key basis.

The purpose of study is to understand and investigate into the data quality. There are many approaches in the literature that can be applied to studying data quality. A data life cycle which focuses on the sequence of activities from creation to disposition of data has been proposed. Another concept that might be applicable is the value chain, where defining, gathering and compiling data are categorized by the value they add at each stage in information system. Other approaches to the data quality problem include an electronic data processing (EDP) audit and database integrity. Although all of these approaches have merits, we choose to

draw upon an analogy that exists between quality issues in an information systems environment.

1.3 Objectives of the Study

The AGMARKNET Portal, though fully functional for the last decade and a half, still suffers from certain shortcomings that raise questions upon the quality and integrity of the data being provided by the portal. The data containing marketing information about the various agricultural produce is being uploaded on the portal at the end of each day. This makes the data prone to human errors which may be either deliberate or unintentional in nature. This study aims to find out whether such errors exist and to evaluate the quality of the data being provided by the AGMARKNET portal. Since it would be impractical to evaluate the data of all the commodities being listed on the portal, we shall only evaluate the data for one of the non-perishable commodities i.e. Maize. The data is to be collected daily for the commodity and then recorded again after a specific period of time to look for any anomalies.

The objectives of this study are as follows:

1. To uncover any faults / errors / shortcomings in the data being uploaded on the AGMARKNET portal.
2. To evaluate the data being uploaded on the AGMARKNET portal in terms of accuracy, integrity and reliability.

Chapter 2

Literature Review

A lot of literature is available on agricultural marketing and its' management. It is neither desirable nor possible to survey the whole literature. Therefore, only those relevant works have been reviewed, which reveal some general idea and provide a rationale for the present study. Such review of literatures always helps the researcher in getting an overview of the problem under study. It, moreover, helps to identify areas where in-depth research has not been carried out. Such as identification of fresh areas facilitate the taking up of new and meaningful research work.

2.1 WHAT IS AGRICULTURAL MARKETING?

Agricultural marketing can best be defined as series of services involved in moving a product from the point of production to the point of consumption. Thus agricultural marketing is a series of interconnected activities involving: planning production, growing and harvesting, grading, packing, transport, storage, agro-and food processing, distribution, and sale (Tracey, 2003). Such activities cannot take place without the exchange of information and are often heavily dependent on the availability of suitable finance. Marketing systems are dynamic. They are competitive and involve continuous change and improvement. Businesses that prosper, have lower costs, are more efficient and can deliver quality products. Those who have high costs, do not adapt to changes in market demand and provide poor quality are often forced out of business. Marketing has to be customer-oriented and has to provide the farmer, transporter, trader, processor, etc. with a profit. This requires those involved in marketing chains to understand buyer requirements, both in terms of product and business conditions.

2.2 MARKET INFORMATION

Efficient market information can be shown to have positive benefits for farmers and traders. Up-to-date information on prices and other market factors enables farmers to negotiate with traders and also facilitates spatial distribution of products from rural areas to towns and between markets. Most governments in developing countries have tried to provide market information services to farmers, but these have tended to experience problems of sustainability. Moreover, even when they function, the service provided is often insufficient to allow commercial decisions to be made because of time lags between data collection and dissemination (Barrett, 1997). Modern communications technologies open up the possibilities for market information services to improve information delivery through SMS on cell phones and the rapid growth of FM radio stations in many developing countries offers the possibilities of more localized information services. In the longer run, the internet may become an effective way of delivering information to farmers in developing countries like India. However, problems associated with the cost and accuracy of data collection still remain to be addressed. Even when they have access to market information, farmers often require assistance in interpreting that information. For example, the market price quoted on the radio may refer to a wholesale selling price and farmers may have difficulty in translating this into a realistic price at their local assembly market (Barrett and. Carter, 1999). Various attempts have been made in developing countries to introduce commercial market information services but these have largely been targeted at traders, commercial farmers or exporters. It is not easy to see how small, poor farmers can generate sufficient income for a commercial service to be profitable, although, in India a new service introduced by Thompson Reuters was reportedly used by over 100,000 farmers in its first year of operation (Fafchamps and Minten, 2001).

2.3 MARKETING TRAINING

Farmers frequently consider marketing as being their major problem. However, while they are able to identify such problems as poor prices, lack of transport and high post-harvest losses, they are often poorly equipped to identify potential solutions. Successful marketing requires learning new skills, new techniques and new ways of obtaining information. Extension officers working with ministries of agriculture or NGOs are often well-trained in horticultural production techniques but usually lack knowledge of marketing or post-harvest handling (Fickler and Goodwin, 2001). Ways of helping them develop their knowledge of these areas, in order to be better able to advise the farmers about market-oriented horticulture, need to be explored. While there is a range of generic guides and other training materials available from FAO and others, these should ideally be tailored to national circumstances to have maximum effect.

2.4 ROLE OF AGRICULTURAL MARKETING SYSTEM IN ECONOMIC DEVELOPMENT

Rao (2000) in his study, "Experience in Agricultural Marketing in India" states that it is only now that the developing countries have increasingly recognized that the agricultural marketing system plays a crucial role in economic development, not only by physically distributing increased production through incentives but also distributing the benefits of growth. As a result, many governments have now tried many approaches to develop the marketing system, with varying degrees of success. Jaganathan (1997) in his paper "Utilization of Regulated Markets by Farmers in Periyar District, Tamil Nadu", outlines that the establishment of regulated markets to solve marketing problems could be reflected in their proper utilization by farmers for deriving economic benefits. A high degree of utilization of regulated markets by farmers would lead the farming community to higher standard of living.

2.5 IMPORTANCE OF FAIR PRICE TO BOTH FARMERS AND CONSUMERS

Organized market can alone ensure fair price to producers as well as consumers. Farmers' markets operate in the same line. If marketing of agricultural produce is properly organized, it can fetch a good price to the farmer and he will be inspired to produce more. The interest of the consumer will also be taken care of side by side. An efficient and properly organized marketing should get along with price strategies. Therefore, insure fair price to the producer as well as to the consumer.

2.6 GREEN REVOLUTION

M.S. Swaminathan, the eminent agricultural scientist, analyzing the success of green revolution in Punjab state "The green revolution in Punjab is not a miracle". It happened only because the following prerequisites for its success existed in mid-sixties.

1. Land consolidation and levelling.
2. Owner cultivation resulting in a long term stake in land.
3. Rural communication.
4. Rural electrification and
5. A dynamic agricultural university.

According to Acharya (2004), India's age old farming practice has taken a turn in the recent years. There had been a technological breakthrough after the advent of Green Revolution, the evolution of high-yielding variety seeds, increased use of fertilizers, insecticides and pesticides, installation of pump sets and tractorisation and mechanization. This technological breakthrough has led to a substantial increase in production on the farms and to a large marketable and marketed surplus.

2.7 AGMARKNET – GLOBALISATION OF INDIAN AGRICULTURE & GREEN REVOLUTION

A step towards globalization of Indian agriculture, and a step in bringing another green revolution the e-governance portal AGMARKNET facilitates generation and transmission of prices, commodity arrival information from agricultural produce markets, and Web-based dissemination to producers, consumers, traders, and policy makers transparently and quickly.

It aims at improving the decision-making capability of the farmers and strengthening their bargaining power.

2.7.1 Situation

Agricultural marketing is an initiative to bring the second generation of green revolution problems. Indian marketing is undergoing a significant metamorphosis because of economic liberalization and globalization.

Market information is an important aspect of agricultural marketing. The importance of sound agricultural marketing policies for ensuring fair returns to the farmers cannot be overemphasized.

Therefore, it has become necessary on the part of the regulatory agencies to ensure remunerative prices to farmers for the sale of their produce, to boost up their efforts for increasing and sustaining the agricultural production. Almost all states and union territories are providing market information in one form or the other for the benefits of market users like producers, traders, and consumers. However, the information is collected and disseminated by use of conventional methods causing inordinate delay in communicating to different groups and this, in turn, adversely affects their economic interest.

Therefore, the availability and dissemination of complete and accurate marketing information is the key to achieve both operational and pricing efficiency in the marketing system.

To strengthen interface with farmers and other beneficiaries, AGMARKNET portal has been evolved. Over 600 markets regularly report price-related data being disseminated through the portal. The portal also serves as a single window for accessing Web sites of various organizations.

It also provides weekly trend analysis, linkage to online commodity exchange of India, Food and Agriculture Organization (FAO), Indian Farmers Fertilizer Cooperative Limited (IFFCO) Web site, and so forth.

The development of the AGMARKNET portal and the state-level portal, and undertaking market-led extension activities are important components of this scheme. AGMARKNET ensures dissemination of data through the network to any distance for the benefit of citizens, farmers, traders, and consumers.

The improved communication system has enabled producers to learn about probable markets in which their produce can be disposed more profitably. Also the modernization of the market information system has led to efficiency in markets and increased participation of the farmers.

2.7.2 Knowledge Portal

The AGMARKNET portal is constantly enriched with agricultural marketing-related information. Efforts are on to reach out to the farmers in their regional languages. As of now, the portal is disseminating daily prices and arrivals information in eleven regional languages: Hindi and Punjabi. The portal also caters to the diversified needs of these stakeholders by providing the following agricultural marketing-related information as a single window Web service over the Internet.

2.7.3 Price and Arrivals

The portal provides access to commodity-wise, variety-wise daily prices and arrivals information of various wholesale markets. Future prices from the three national multi-commodity exchanges, viz. Multi Commodity Exchange of India (MCX), National Commodity & Derivatives Exchange (NCDEX) and National Multi Commodity Exchange of India Ltd. (NMCE), are also reflected on the portal.

2.7.4 Commodities and Varieties

A commodity base, comprising of more than 300 commodities and about 2,000 varieties has been evolved. The commodities are being categorized into various groups: beverages, cereals, drug and narcotics, dry fruits, fiber crops, flowers, forest products, fruits, livestock, poultry, fisheries, oil seeds, pulses, spices, vegetables and others, to facilitate easy retrieval of market information.

2.7.5 Grading and Standardization

To promote the importance of quality among the farming community, the portal emphasizes on standardization and grading aspects of the agricultural products. The information is provided in the form of documents/specifications prescribed by the act/rules of DMI and other agencies. It also links to the Codex International food standards, guidelines, and related texts such as the codes of practice under the joint FAO/World Health Organization (WHO) Food Standards Programme.

2.7.6 Benefits

The AGMARKNET project has strengthened the interfaces among government organizations, farmers, industry, policy makers, and other beneficiaries.

The project also aims at empowering the farming community with market information. For maximizing the benefits it needs to be integrated with other ICT initiatives targeting the upliftment of rural India. The project is part of National eGovernment action plan of Government of India.

2.7.7 Efficient and timely utilization of market data

AGMARKNET has helped establish a nationwide information network for speedy collection and dissemination of market data for efficient and timely utilization.

2.7.8 Farmer empowerment

The AGMARKNET has already emerged as the sun-shine website to bargain better prices for their produce, and marching ahead towards becoming an e-Commerce and e-Business Portal in India.

2.7.9 Improvement in agricultural marketing

Progressive sensitization and orientation of farmers helps them respond to new challenges in agricultural marketing by using Information, Communication and Technology (ICT) as a vehicle of extension.

2.8 Conclusion of the Review

The review concludes that multiple arguments do exist in international and national literature on the ways and need of marketing of Agriculture in overall as well as specifically in our country India and methods in which systems can be developed to centralize the overall produce , consumption , prices and distribution of Agricultural Produce in the country. One such step in that direction has been AGMARKNET. All schools of thought acknowledge the powerful effects of the regulated markets namely farmer motivation, team work of officials, organizational commitment, farmer orientation, and increasing the arrivals.

Chapter 3

Methodology

3.1 Significance of the study

As a step towards globalization of agriculture, the Directorate of Marketing & Inspection (DMI) has embarked upon an ICT project: NICNET based Agricultural Marketing Information System Network (AGMARKNET)" in the country, during the Ninth Plan, for linking all-important APMCS (Agricultural Produce Market Committees), State Agricultural marketing Boards / Directorates and OMI regional offices located throughout the country, for effective information exchange on market prices NIC implements this project on a turn-key basis.

The purpose of study is to understand and investigate into the data quality. There are many approaches in the literature that can be applied to study data quality. A data life cycle which focuses on the sequence of activities from creation to disposition of data has been proposed. Another concept that might be applicable is the value chain, where defining, gathering and compiling data are categorized by the value they add at each stage in information system. Other approaches to the data quality problem include an electronic data processing (EDP) audit and database integrity. Although all of these approaches have merits, we choose to draw upon an analogy that exists between quality issues in an information systems environment. The methodology progresses in two phases. The steps in phase I are important preliminary activities, while phase II lists the steps necessary to compile and analyze the data to check quality of data.

3.2 Process of analysis

Phase I – Preliminary activities

Step 1: Write a mission statement, decides the purpose of project and what are we looking for.

Step 2: Identify the market data for a particular commodity, which includes arrival, minimum price, maximum price, modal price.

Phase II – Compile and analyze the data

Step 1: Record the commodity data on daily basis

Step 2: Compile the data of same date observed on different dates

Step 3: Test data

Step 4: In depth analysis of internal data like arrival and modal price

Step 5: Findings

Step 6: Recommendations, keeping resource constraints and feasibility in mind.

3.2.1 Phase I

The two steps in phase I build the foundation for the organizations to successfully address data quality and information. Step 1 asks the organization to write a mission statement, if one does not exist. This important, yet often overlooked, step ensures that the organization has agreement on its purpose for existence. Step 2 identifies the data of different commodity on daily basis. Although this seems obvious, in many organizations, there are multiple checks. The exercise of focusing on the modal price is useful. This is accomplished by the first defining the term “modal price” as “price at which maximum quantity has been sold of a particular commodity”. Phase II moves the team into compilation and analyzing for the quality of data.

3.2.2 Phase II

Phase II identifies, defines, compile and analyze the data. Perspective 1 obtains input from the mandi; it seems obvious that the input would be solicited. Surrogate middleman, or staff personnel who interact closely with the farmer, provide perspective 2 for quality check of data. They are experts with respect to the process and the farmer interactions with the process. Not only do they have

Knowledge of underlying issues, but they have the benefit of multiple interactions with multiple farmers.

Steps 1, 2 and 3 in Phase II obtain input from the three perspectives mentioned above, while Step 4 combines the three sources of input. Step 5 and 6 define the dimensions and test the definitions. Step 7, 8 and 9 prioritize the resulting process and service quality.

Step 1:

- Record data of each commodity on daily basis for a limited time period mentioned in our report. We have to keep arrival and price in our data, So choose both option in filter and then download the data.
- As we are doing research on data quality, we choose a particular commodity for this purpose. We need to record for whole markets covered under AGMARKNET project.

Step 2:

- In this step compilation need to be done. We gathered data of commodity on daily basis and gathered data of same date in next 2 or 3 consecutive days.
- The aim here is to verify whether the data of commodities is being updated daily or not.

Step 3:

- The aim here is to verify whether the data of commodities is being updated daily or not. If not, then it identifies that the purpose of the AGMARKNET portal is not being fulfilled. The AGMARKNET portal is supposed to have daily updates of data from the various markets across the country.
- Second purpose is to check the price (modal price) of each market. We need to check whether the modal price is wrongly reported as the average of min. and max. Price. As per definition, modal price is the price at which maximum quantity of the commodity is sold.

Step 4:

- This iterative process is performed by the team of experts. Emphasis is placed on data received directly from the portal. There is need to check the trend of prices and find out the markets who are doing wrong data reporting repeatedly.
- The sole purpose of this portal is to serve the information on daily basis. If farmers do not get the information on time then it has little value. The dimensions now must be defined and prioritized.

Step 5:

- This step is an attempt to find flaws in data quality and how to improve it. Data quality is not related to complete data only. It is also related to correct data or information on time.
- Mandis or markets need to be identified who have not reported correct and complete data on time.

Step 6:

- In this step we provide recommendations and solutions to improve the data quality available on portal.
- Certain background checks and new approaches will be discussed to record data.

Chapter 5

Data Analysis

4.1 Introduction

Two different types of analyses were performed on the data retrieved from the AGMARKNET portal. Firstly, the data was analyzed as a whole. This helped in identifying major trends in the data. Secondly, data collected on individual days were analyzed and compared together. This helped to obtain in-depth insight into the data. Observations regarding the following aspects of data were made:

1. Are all nodes updating the data to the portal regularly as expected?
2. Is the data represented on the portal complete?
3. If the data is not being updated timely, then, are there some nodes who are defaulting from the protocol on a regular basis?
4. Is the modal price being correctly recorded? Or is there evidence that mean of minimum and maximum price is being wrongly recorded as modal price? Are there any nodes who are defaulting from the protocol in this manner on a regular basis?

4.2 Analysis Tools:

MySQL Community Edition as part of XAMPP software package

MySQL Community Edition is the freely downloadable version of the world's most popular open source database. It is available under the GPL license and is supported by a huge and active community of open source developers. It is available as part of the XAMPP free open-source software package. XAMPP is a compilation of free software (comparable to a Linux distribution), it's free of charge and it's free to copy under the terms of the GNU General Public License. But it is only the compilation of XAMPP that is published under GPL.

MySQL has been used in this project to analyze in aggregate the voluminous data collected from the AGMARKNET portal. The data, which was recorded initially in

Microsoft Excel Spreadsheet format (.xls), first had to be converted into Comma Separate Format (.csv) and then all the data was uploaded into the MySQL database. Through the use of SQL queries, the data was analyzed and observations were made.

Microsoft Excel 2013

Microsoft Excel is a spreadsheet developed by Microsoft for Windows, Mac OS X, Android and iOS. It features calculation, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications. It has been a very widely applied spreadsheet for these platforms, especially since version 5 in 1993. It forms part of Microsoft Office Software Suite.

Microsoft Excel has been used in this project for analyzing and comparing data collected on individual days.

4.3 Data Analysis

Observation 4.3.1: Late updation of data

When data of commodity Maize was re-recorded after a certain period of time, it showed entirely new nodes which had not uploaded their data previously. For example, when data of March 3rd, 2016 was recorded at the end of the day, the state of Andhra Pradesh had data of 2 varieties of Maize uploaded by 8 market centers in 3 districts. However when the data of March 3rd, 2016 was retrieved again on March 11th, 2016, the state of Andhra Pradesh had data of 3 varieties of Maize, recorded by 10 market centers in 4 districts. Numerous such cases were observed throughout the period of the study.

Server: 127.0.0.1 » Database: agmarknetmaize » Table: daily_commodity_data

Showing rows 0 - 24 (1010 total. Query took 0.0350 seconds.)

```
select distinct(state_name), count(distinct(district_name)), count(distinct(market_center_name)), count(distinct(Variety)), date_arrival, date_recorded from daily_commodity_data group by state_name, date_arrival, date_recorded
```

[Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

1 > >> Number of rows: 25 Filter rows: Search this table

state_name	count(distinct(district_name))	count(distinct(market_center_name))	count(distinct(Variety))	date_arrival	date_recorded
Andhra Pradesh	3	8	2	2016-03-11	2016-03-11
Andhra Pradesh	4	10	3	2016-03-11	2016-03-23
Andhra Pradesh	2	2	1	2016-03-12	2016-03-12
Andhra Pradesh	4	8	3	2016-03-12	2016-03-23
Andhra Pradesh	2	2	2	2016-03-13	2016-03-13
Andhra Pradesh	5	9	5	2016-03-13	2016-03-23
Andhra Pradesh	3	8	4	2016-03-14	2016-03-14
Andhra Pradesh	4	9	5	2016-03-14	2016-03-25
Andhra Pradesh	5	13	4	2016-03-15	2016-03-15

Figure 4.1 – New markets and varieties added when data of the same day was re-recorded at a subsequent date

SQL Query used:



```
select distinct(state_name), count(distinct(district_name)),  
count(distinct(market_center_name)), count(distinct(Variety)), date_arrival,
```

date_recorded from daily_commodity_data group by state_name, date_arrival, date_recorded

Additionally upon careful analysis of data recorded for individual days, it was discovered that some updates were made at least ten days after the original data for the day was posted.



	A	B	C	D	E	F	G	H	I	J	K	L
1	Both Price And Arrival [Maize] of 29-Mar-2016											
	state_name	district_name	market_center_name	Variety	group_name	Arrival recorded on 20th April, 2016	Arrival recorded on 10th April, 2016	Arrival recorded on 29th March, 2016	MIN	MAX	MODAL	date_arrival
2												
36	Karnataka	Belgaum	Sankeshwar	Hybrid/Local	Cereals	10	10	#N/A	1300	1400	1350	29-Mar-16
37	Karnataka	Bellary	Bellary	Local	Cereals	13	13	13	1272	1417	1389	29-Mar-16
38	Karnataka	Bellary	Bellary	Sweet Corn (For Biscuits)	Cereals	13	13	13	1819	1819	1819	29-Mar-16
39	Karnataka	Bellary	H.B. Halli	Local	Cereals	35	35	35	1300	1325	1325	29-Mar-16
40	Karnataka	Bellary	Hoovinahadagali	Yellow	Cereals	187	#N/A	#N/A	1320	1350	1330	29-Mar-16
41	Karnataka	Bijapur	Sindagi	Hybrid/Local	Cereals	12	12	#N/A	1200	1300	1250	29-Mar-16
42	Karnataka	Chikmagalur	Bagepalli	Other	Cereals	15	15	#N/A	1325	1400	1350	29-Mar-16
43	Karnataka	Chitradurga	Challakere	Yellow	Cereals	89	89	#N/A	1129	1426	1375	29-Mar-16
44	Karnataka	Chitradurga	Holalkere	Yellow	Cereals	219	219	219	1380	1420	1395	29-Mar-16
45	Karnataka	Davangere	Davangere	Local	Cereals	210	210	210	1355	1381	1370	29-Mar-16
46	Karnataka	Davangere	Harappana Halli	Hybrid/Local	Cereals	204	204	#N/A	1350	1500	1400	29-Mar-16
47	Karnataka	Davangere	Harihara	Hybrid/Local	Cereals	13	13	13	1430	1430	1430	29-Mar-16
48	Karnataka	Davangere	Honnali	Local	Cereals	18	18	18	1510	1510	1510	29-Mar-16
49	Karnataka	Dharwad	Dharwar	Local	Cereals	25	25	25	1300	1350	1330	29-Mar-16
50	Karnataka	Dharwad	Hubli (Amaragol)	Local	Cereals	1	1	1	1350	1350	1350	29-Mar-16
51	Karnataka	Dharwad	Kalagategi	Local	Cereals	35	35	#N/A	1325	1370	1325	29-Mar-16

Table 4.1 – Late updation of data of maize for 29-March-2016

-  - represents data uploaded at least 1 day late
-  - represents data uploaded at least 10 days late

	A	B	C	D	E	F	G	H	I	J	K	L
1	Both Price And Arrival [Maize] of 30-Mar-2016											
	state_name	district_name	market_center_name	Variety	group_name	Arrival recorded on 20th April, 2016	Arrival recorded on 10th April	Arrival recorded on 30 march	MIN	MAX	MODAL	date_arrival
2												
39	Maharashtra	Ahmednagar	Sangamner	Other	Cereals	11	11	11	1365	1400	1375	30-माच-16
30	Maharashtra	Aurangabad	Sillod	Yellow	Cereals	46	46	#N/A	1330	1420	1365	30-माच-16
31	Maharashtra	Aurangabad	Sillod(Bharadi)	Yellow	Cereals	25	25	#N/A	1350	1450	1400	30-माच-16
32	Maharashtra	Jalana	Bhokardan	Yellow	Cereals	4	4	#N/A	1350	1375	1360	30-माच-16
33	Maharashtra	Jalgaon	Jalgaon	Deshi Red	Cereals	3	3	3	1345	1345	1345	30-माच-16
34	Maharashtra	Jalgaon	Jamner	Deshi Red	Cereals	3	3	3	1325	1387	1342	30-माच-16
35	Maharashtra	Jalgaon	Jamner(Neri)	Deshi Red	Cereals	2	2	2	1325	1380	1336	30-माच-16
36	Maharashtra	Nandurbar	Akkalkuwa	Other	Cereals	30	#N/A	#N/A	1370	1400	1390	30-माच-16
37	Maharashtra	Nandurbar	Navapur	Other	Cereals	3	3	#N/A	1350	1400	1369	30-माच-16
38	Maharashtra	Pune	Indapur(Nimgaon Ketki)	Deshi Red	Cereals	19	#N/A	#N/A	1411	1455	1445	30-माच-16
39	Maharashtra	Pune	Nira(Saswad)	Other	Cereals	1	1	#N/A	1400	1575	1487	30-माच-16
00	Maharashtra	Pune	Pune	Other	Cereals	6	6	6	1650	1750	1735	30-माच-16
01	Maharashtra	Raigad	Karjat(Raigad)	Yellow	Cereals	1	1	#N/A	1350	1350	1350	30-माच-16
02	Maharashtra	Sangli	Tasgaon	Other	Cereals	23	23	23	1370	1400	1390	30-माच-16
03	Maharashtra	Satara	Vaduj	Deshi Red	Cereals	10	10	10	1400	1450	1425	30-माच-16
04	-	-	-	-	Maharashtra Sub Total	188	107.8	107.8	0	0	0	

Table 4.2 – Late updation of data of maize for 30-March-2016

-  - represents data uploaded at least 1 day late
-  - represents data uploaded at least 10 days late

These observations can also attribute to the fact that the total arrival data is observed as changed when re-recorded at a later date.

	A	B	C	D	E	F	G	H	I	J
1	Both Price And Arrival [Maize] of 29-Mar-2016									
2	state_name	district_name	market_center_name	Variety	group_name	Arrival	MIN	MAX	MODAL	date_arrival
107	Uttar Pradesh	Firozabad	Shikohabad	Hybrid	Cereals	2.5	0	0	1530	29-Mar-16
108	Uttar Pradesh	Hardoi	Hardoi	Other	Cereals	15	1420	1460	1440	29-Mar-16
109	Uttar Pradesh	Muradabad	Bhehjai	Other	Cereals	8	0	0	1485	29-Mar-16
110	Uttar Pradesh	Muzaffarnagar	Muzaffarnagar	Other	Cereals	9	0	0	1680	29-Mar-16
111	-	-	-	-	Uttar Pradesh Sub Total	148.5	0	0	0	
112	West Bengal	Malda	Samsi	H.Y.V.	Cereals	50	1390	1420	1400	29-Mar-16
113	-	-	-	-	West Bengal Sub Total	50	0	0	0	
114	-	-	-	-	Total	4668.88	0	0	0	

Table 4.3– Total arrival for 29-March-2016 as recorded on 29-March-2016

	A	B	C	D	E	F	G	H	I	J
1	Both Price And Arrival [Maize] of 29-Mar-2016									
2	state_name	district_name	market_center_name	Variety	group_name	Arrival	MIN	MAX	MODAL	date_arrival
147	Uttar Pradesh	Faizabad	Faizabad	Yellow	Cereals	40	1670	1695	1680	29-Mar-16
148	Uttar Pradesh	Firozabad	Shikohabad	Hybrid	Cereals	2.5	0	0	1530	29-Mar-16
149	Uttar Pradesh	Hardoi	Hardoi	Other	Cereals	15	1420	1460	1440	29-Mar-16
150	Uttar Pradesh	Hardoi	Madhoganj	Other	Cereals	4	1500	1550	1520	29-Mar-16
151	Uttar Pradesh	Kannuj	Chhibramau(Kannuj)	Yellow	Cereals	30	0	0	1420	29-Mar-16
152	Uttar Pradesh	Muradabad	Bhehjai	Other	Cereals	8	0	0	1485	29-Mar-16
153	Uttar Pradesh	Muzaffarnagar	Muzaffarnagar	Other	Cereals	9	0	0	1680	29-Mar-16
154	-	-	-	-	Uttar Pradesh Sub Total	182.5	0	0	0	
155	West Bengal	Malda	Samsi	H.Y.V.	Cereals	50	1390	1420	1400	29-Mar-16
156	-	-	-	-	West Bengal Sub Total	50	0	0	0	
157	-	-	-	-	Total	6762.25	0	0	0	

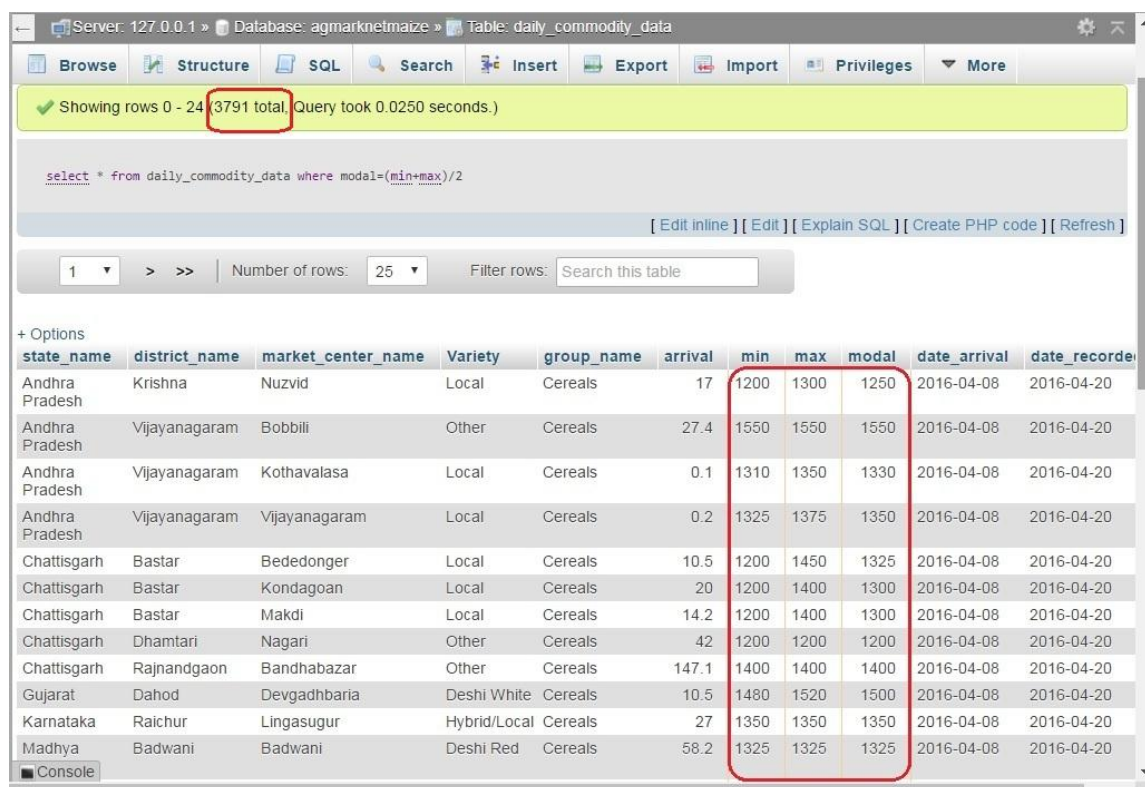
Table 4.4 – Total arrival for 29-March-2016 as recorded on 10-April-2016

	A	B	C	D	E	F	G	H	I	J
1	Both Price And Arrival [Maize] of 29-Mar-2016									
2	state_name	district_name	market_center_name	Variety	group_name	Arrival	MIN	MAX	MODAL	date_arrival
152	Uttar Pradesh	Kannuj	Chhibramau(Kannuj)	Yellow	Cereals	30	0	0	1420	29-Mar-16
153	Uttar Pradesh	Muradabad	Bhehjai	Other	Cereals	8	0	0	1485	29-Mar-16
154	Uttar Pradesh	Muzaffarnagar	Muzaffarnagar	Other	Cereals	9	0	0	1680	29-Mar-16
155	-	-	-	-	Uttar Pradesh Sub Total	182.5	0	0	0	
156	West Bengal	Malda	Samsi	H.Y.V.	Cereals	50	1390	1420	1400	29-Mar-16
157	-	-	-	-	West Bengal Sub Total	50	0	0	0	
158	-	-	-	-	Total	6949.25	0	0	0	

Table 4.5 – Total arrival for 29-March-2016 as recorded on 20-April-2016

Observation 4.3.2: Mean of Minimum and Maximum Prices for the day, being recorded in place of Modal Price

Numerous instances were found where the Mean of Minimum and Maximum prices for the day was being recorded in place of Modal Price. The Modal Price for the day for a commodity is supposed to represent the price at which maximum trading of that commodity occurred. However, replacing this data with a simple arithmetic mean of minimum and maximum price of the day, simply defeats the purpose of recording this data altogether.



Server: 127.0.0.1 » Database: agmarknetmaize » Table: daily_commodity_data

Showing rows 0 - 24 (3791 total, Query took 0.0250 seconds.)

```
select * from daily_commodity_data where modal=(min+max)/2
```

[Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

1 > >> | Number of rows: 25 | Filter rows: Search this table

+ Options

state_name	district_name	market_center_name	Variety	group_name	arrival	min	max	modal	date_arrival	date_recorder
Andhra Pradesh	Krishna	Nuzvid	Local	Cereals	17	1200	1300	1250	2016-04-08	2016-04-20
Andhra Pradesh	Vijayanagaram	Bobbili	Other	Cereals	27.4	1550	1550	1550	2016-04-08	2016-04-20
Andhra Pradesh	Vijayanagaram	Kothavalasa	Local	Cereals	0.1	1310	1350	1330	2016-04-08	2016-04-20
Andhra Pradesh	Vijayanagaram	Vijayanagaram	Local	Cereals	0.2	1325	1375	1350	2016-04-08	2016-04-20
Chattisgarh	Bastar	Bededonger	Local	Cereals	10.5	1200	1450	1325	2016-04-08	2016-04-20
Chattisgarh	Bastar	Kondagoan	Local	Cereals	20	1200	1400	1300	2016-04-08	2016-04-20
Chattisgarh	Bastar	Makdi	Local	Cereals	14.2	1200	1400	1300	2016-04-08	2016-04-20
Chattisgarh	Dhamtari	Nagari	Other	Cereals	42	1200	1200	1200	2016-04-08	2016-04-20
Chattisgarh	Rajnandgaon	Bandhabazar	Other	Cereals	147.1	1400	1400	1400	2016-04-08	2016-04-20
Gujarat	Dahod	Devghadbaria	Desi White	Cereals	10.5	1480	1520	1500	2016-04-08	2016-04-20
Karnataka	Raichur	Lingasugur	Hybrid/Local	Cereals	27	1350	1350	1350	2016-04-08	2016-04-20
Madhya	Badwani	Badwani	Desi Red	Cereals	58.2	1325	1325	1325	2016-04-08	2016-04-20

Console

Figure 4.2 – Mean of minimum and maximum prices for the day recorded in place of modal price

SQL Query used:

```
select * from daily_commodity_data where modal=(min+max)/2
```

Observation 4.3.3: Markets which have repeatedly recorded the mean of minimum and maximum prices as the modal price:

Several markets (Refer Annexure-I) were found to have recorded mean of maximum and minimum prices of the day in place of the modal price. Out of 46 days of recorded day, some of the markets showed that this manner of error occurred on more than 30 days.

Showing rows 0 - 24 (298 total) Query took 0.0170 seconds.)

```
SELECT market_center_name, state_name, district_name, count(market_center_name) FROM `vw_modal_is_avg_datearrival` group by market_center_name
ORDER BY count(market_center_name) DESC
```

[Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

1 > >> ☐ Show all Number of rows: 25 Filter rows:

+ Options

market_center_name	state_name	district_name	count(market_center_name)
Sardarnagar	Telangana	Ranga Reddy Dist.	34
Pargi	Telangana	Ranga Reddy Dist.	32
Kothavalasa	Andhra Pradesh	Vijayanagaram	30
Vijayanagaram	Andhra Pradesh	Vijayanagaram	30
Bangalore	Karnataka	Bangalore	28
Kudchi	Karnataka	Belgaum	27
Gandhari	Telangana	Nizamabad	23
Kasganj	Uttar Pradesh	Etah	22
Gangadhara	Telangana	Karimnagar	22
Bobbili	Andhra Pradesh	Vijayanagaram	21
Bhilwara	Rajasthan	Bhilwara	21
Rajasamand	Rajasthan	Rajasamand	20
Sattupalli	Telangana	Khammam	20
Bichhiya	Madhya Pradesh	Mandla	19
Harbhara	Karnataka	Davangere	19

Figure 4.3 – Markets which have constantly uploaded mean of minimum and maximum prices for the day in place of modal price

SQL Query used:

(i) CREATE

ALGORITHM = UNDEFINED

VIEW `vw_modal_is_avg`

AS select * from daily_commodity_data where modal=(min+max)/2 and
date_recorded = date_arrival

(ii) `SELECT market_center_name, state_name, district_name,
count(market_center_name) FROM `vw_modal_is_avg_datearrival` group by
market_center_name ORDER BY count(market_center_name) DESC`

Example: Markets Sardarnagar and Pargi from the state of Telangana, show mean of maximum and prices of the day being recorded in place of modal price for many days in a row.

Server: 127.0.0.1 » Database: agmarknetmaize » Table: daily_commodity_data

Showing rows 0 - 24 (34 total, Query took 0.0240 seconds.) [date_arrival: 2016-03-11... - 2016-04-09...]

```
select * from daily_commodity_data where modal=(min+max)/2 and date_recorded = date_arrival and market_center_name = 'Sardarnagar' ORDER BY  
'daily_commodity_data'.date_arrival ASC
```

[Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

1 > >> | ☐ Show all | Number of rows: 25 | Filter rows: Search this table

+ Options

state_name	district_name	market_center_name	Variety	group_name	arrival	min	max	modal	date_arrival	date_recorded
Telangana	Ranga Reddy Dist.	Sardarnagar	Local	Cereals	0.1	1450	1450	1450	2016-03-11	2016-03-11
Telangana	Ranga Reddy Dist.	Sardarnagar	Local	Cereals	0.1	1440	1440	1440	2016-03-12	2016-03-12
Telangana	Ranga Reddy Dist.	Sardarnagar	Local	Cereals	0.1	1450	1450	1450	2016-03-13	2016-03-13
Telangana	Ranga Reddy Dist.	Sardarnagar	Local	Cereals	0.1	1450	1450	1450	2016-03-14	2016-03-14
Telangana	Ranga Reddy Dist.	Sardarnagar	Local	Cereals	0.1	1450	1450	1450	2016-03-15	2016-03-15
Telangana	Ranga Reddy Dist.	Sardarnagar	Local	Cereals	0.1	1430	1430	1430	2016-03-17	2016-03-17
Telangana	Ranga Reddy Dist.	Sardarnagar	Local	Cereals	0.1	1425	1425	1425	2016-03-18	2016-03-18
Telangana	Ranga Reddy Dist.	Sardarnagar	Local	Cereals	0.1	1425	1425	1425	2016-03-19	2016-03-19
Console	Ranga Reddy	Sardarnagar	Local	Cereals	0.1	1455	1455	1455	2016-03-20	2016-03-20

Figure 4.4 – Modal price wrongly updated consecutively for several days by Sardarnagar market in the state of Telangana

SQL Query used:

```
select * from daily_commodity_data where modal=(min+max)/2 and  
date_recorded = date_arrival and market_center_name = 'Sardarnagar'
```

Server: 127.0.0.1 » Database: agmarknetmaize » Table: daily_commodity_data										
Browse	Structure	SQL	Search	Insert	Export	Import	Privileges	More		
state_name	district_name	market_center_name	Variety	group_name	arrival	min	max	modal	date_arrival	date_recorded
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1480	1480	1480	2016-03-11	2016-03-11
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	4.8	1400	1440	1420	2016-03-12	2016-03-12
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1450	1450	1450	2016-03-13	2016-03-13
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1450	1450	1450	2016-03-14	2016-03-14
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1450	1450	1450	2016-03-15	2016-03-15
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1450	1450	1450	2016-03-17	2016-03-17
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1425	1425	1425	2016-03-19	2016-03-19
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1425	1425	1425	2016-03-20	2016-03-20
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1435	1435	1435	2016-03-21	2016-03-21
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1440	1440	1440	2016-03-22	2016-03-22
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1425	1425	1425	2016-03-23	2016-03-23
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1425	1425	1425	2016-03-24	2016-03-24
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1425	1425	1425	2016-03-28	2016-03-28
Telangana	Ranga Reddy Dist.	Pargi	Local	Cereals	0.1	1430	1430	1430	2016-03-29	2016-03-29
Console	Ranga Reddy	Pargi	Local	Cereals	0.1	1450	1450	1450	2016-03-30	2016-03-30

Figure 4.5 – Modal price wrongly updated consecutively for several days by Pargi market in the state of Telangana

SQL Query used:

```
select * from daily_commodity_data where modal=(min+max)/2 and
date_recorded = date_arrival and market_center_name = 'Pargi'
```

Observation 4.3.4 Change in recorded values of arrival, minimum price, maximum price and modal price

Twenty two instances were found (Refer Annexure-II) where the recorded values of arrival, Minimum Price, Maximum Price and/or Modal Price were changed when the data was re-recorded after a period of time.

Server: 127.0.0.1 » Database: agmarketmaize

Structure SQL Search Query Export Import Operations Privileges Routines Events More

```
select a.state_name,a.market_center_name, a.variety,a.date_arrival ,a.date_recorded "Date Recorded A", a.arrival "Arrival A",b.arrival "Arrival B", a.min "Min A",b.min "Min B",a.max "Max A",b.max "Max B", a.modal "Modal A",b.modal "Modal B", b.date_recorded "Date Recorded B" from vw_same_day_records a, vw_re_record b where a.date_arrival=b.date_arrival and a.market_center_name=b.market_center_name and a.variety=b.variety and (a.arrival<>b.arrival or a.min<>b.min or a.max<>b.max or a.modal<>b.modal) order by a.market_center_name
```

[Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☒ Show all | Number of rows: All | Filter rows: Search this table

state_name	market_center_name	Variety	date_arrival	Date Recorded A	Arrival A	Arrival B	Min A	Min B	Max A	Max B	Modal A	Modal B	Date Recorded B
Telangana	Badepalli	Local	2016-03-14	2016-03-14	3.5	2.5	1352	1381	1352	1414	1352	1381	2016-03-25
Andhra Pradesh	Bobbili	Other	2016-03-29	2016-03-29	11.5	34.6	1600	1500	1600	1500	1600	1500	2016-04-10
Andhra Pradesh	Bobbili	Other	2016-03-29	2016-03-29	11.5	34.6	1600	1500	1600	1500	1600	1500	2016-04-20
Andhra Pradesh	Bobbili	Other	2016-03-23	2016-03-23	122.8	119	1325	1325	1325	1325	1325	1325	2016-04-03
Madhya Pradesh	Chhindwara	Other	2016-04-13	2016-04-13	72.1	188.1	1250	1239	1295	1400	1270	1320	2016-04-24
Maharashtra	Devala	Yellow	2016-03-15	2016-03-15	13	36	1349	1385	1428	1450	1396	1425	2016-03-26
Telangana	Gangadhara	Hybrid	2016-04-22	2016-04-22	1	0.1	1300	1300	1300	1300	1300	1300	2016-04-24
Telangana	Jagtial	Hybrid	2016-04-13	2016-04-13	18.5	22	1375	1380	1420	1418	1400	1400	2016-04-24
Maharashtra	Jamner(Neri)	Deshi Red	2016-04-13	2016-04-13	1	1	4900	1325	5000	1340	4959	1332	2016-04-24
Telangana	Kallur	Local	2016-03-17	2016-03-17	51	34	1200	1200	1350	1300	1250	1250	2016-03-27
Telangana	Kesamudram	Local	2016-04-13	2016-04-13	15.2	201.3	1100	1100	1427	1427	1375	1375	2016-04-24
Console	Lasalqaon(Niphad)	Other	2016-03-21	2016-03-21	11	12	1351	1351	1456	1464	1450	1448	2016-03-31

Figure 4.6 – Change in recorded values of arrival, minimum price, maximum price and modal price for the same date.

SQL Query Used:

(i) CREATE

ALGORITHM = UNDEFINED

VIEW `vw_same_day_records`

AS select * from daily_commodity_data where date_arrival = date_recorded

(ii) CREATE

ALGORITHM = UNDEFINED

VIEW `vw_re_record`

AS select * from daily_commodity_data where date_arrival <> date_recorded

(iii) select a.state_name,a.market_center_name, a.Variety,a.date_arrival
,a.date_recorded "Date Recorded A", a.arrival "Arrival A",b.arrival "Arrival
B", a.min "Min A",b.min "Min B",a.max "Max A",b.max "Max B", a.modal
"Modal A",b.modal "Modal B", b.date_recorded "Date Recorded B" from
vw_same_day_records a, vw_re_record b where
a.date_arrival=b.date_arrival and
a.market_center_name=b.market_center_name and a.variety=b.variety and
(a.arrival<>b.arrival or a.min<>b.min or a.max<>b.max or
a.modal<>b.modal) order by a.market_center_name

Chapter 5

Findings and Recommendations

5.1 Findings

- (i) It is observed that there is constant delay in updating the data of commodities on the AGMARKNET portal. Many markets do not upload the data on the same day. The data is uploaded on the next day or during the course of the next few days. Additionally, instances have also been discovered where markets have uploaded data as late as at least ten days after the data was first uploaded on the portal.

These delays are preventing from being realized the essential function of making accurate agricultural marketing related information readily available to all the stakeholders.

- (ii) Several instances are recorded where various markets have uploaded the arithmetic mean of the minimum and maximum prices for the day, in place of modal price of the day. Additionally, there are markets which have made this error many times consecutively for several days straight.

The modal price of a commodity is the price at which maximum trading of that commodity occurred. Putting in arithmetic mean of minimum and maximum prices of the commodity for the day, severely affects the overall quality of the data, as the stakeholder are now devoid of the valuable information about the modal price. Also, the information on the AGMARKNET portal is intended to be used for policy making purposes. Feeding of such incorrect information will severely affect the policy making process in an adverse manner.

- (iii) There are also few instances recorded where the values of arrival, minimum price for the day, maximum price for the day and modal price for the day are found to be changed. However, the number of such instances is so few that they can be attributed to error correction activities being carried out by the respective markets.

5.2 Recommendations

- (i) Automation of data upload process: In the current situation, all the data of the day's trade in the various markets, is uploaded to the AGMARKNET portal at the end of the day. Each market compiles the data of all the transactions held throughout the day, identifies the minimum, maximum and modal prices of the commodities, calculates the total arrival of the various commodities, and, only then, can the data be uploaded to the portal.

However, such a method of manual compilation of data leaves room for human errors and also makes the entire process very challenging for the markets, as the amount of data generated in a single day for all the commodities is huge.

It is therefore recommended to make use of Information Technology Solutions to the problem such that each and every transaction that occurs in any given market, should occur through electronic channels only and also with due record keeping. This will ensure that the market personnel do not have to spend considerable time in compiling the data at the end of each working day. This will also ensure that chances of human error are minimized.

In the long run, it will ensure that all data is uploaded to the AGMARKNET portal in due time and can even reach lengths as far as real time updation of data on the portal. Additionally, since all transactions will be processed electronically, it will be possible to record even more aspects of the transactions that occur in the agricultural markets. This will lead to better analyses of the collected data, which is likely to give the policy makers deeper insight into the functioning of agricultural markets.

- (ii) For the short term solutions, the data being uploaded onto the AGMARKNET portal from the different markets across the country, needs to constantly monitored for discrepancies. Periodic checks need to be placed in action by taking a sample of data and checking for irregularities such as late updation of data, uploading arithmetic mean of minimum and maximum prices in place of modal price, markets which upload erroneous data repeatedly, etc. In addition,

the existing system needs to be modified such that proper alerts are generated and sent to the concerned authorities whenever such irregularities in the data are brought to the surface.

(iii) Alternatively, there is need for cleaning and translation of commodity names and synonyms. Due to the diversity of languages and other cultural differences across the country, same crop or commodity may be known by different names in different parts of the country. Due to this, trading of commodities is not picking up the pace that it should have, as the general awareness is not there that the same commodity might be in demand in different parts of the country, but under different names.

However, if a translation of all the different names by which a particular variety of any given commodity is known in different parts of the country, is available, it will greatly boost commodity trading along the length and breadth of the country.

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Annexure-I: Markets and the number of times they have uploaded mean of minimum and maximum prices for the day in place of modal price of maize, arranged in descending order of number of infractions

Market Center Name	State Name	District Name	Number of infractions (count(market_center_name))
Sardarnagar	Telangana	Ranga Reddy Dist.	34
Pargi	Telangana	Ranga Reddy Dist.	32
Kothavalasa	Andhra Pradesh	Vijayanagaram	30
Vijayanagaram	Andhra Pradesh	Vijayanagaram	30
Bangalore	Karnataka	Bangalore	28
Kudchi	Karnataka	Belgaum	27
Gandhari	Telangana	Nizamabad	23
Kasganj	Uttar Pradesh	Etah	22
Gangadhara	Telangana	Karimnagar	22
Bobbili	Andhra Pradesh	Vijayanagaram	21
Bhilwara	Rajasthan	Bhilwara	21
Rajasamand	Rajasthan	Rajasamand	20
Sattupalli	Telangana	Khammam	20
Bichhiya	Madhya Pradesh	Mandla	19
Harihara	Karnataka	Davangere	19
Divai	Uttar Pradesh	Bulandshahar	19
Khammam	Telangana	Khammam	18
Bhadravathi	Karnataka	Shimoga	17
Kolhapur(Laxmipuri)	Maharashtra	Kolhapur	17
Honnali	Karnataka	Davangere	15
Dindori	Madhya Pradesh	Dindori	15
Bellary	Karnataka	Bellary	14
Deoli	Rajasthan	Tonk	14
Gollapally	Telangana	Karimnagar	14
Chhapiheda	Madhya Pradesh	Rajgarh	13
Derol(Vejalpur)	Gujarat	Panchmahals	13
Hubli (Amaragol)	Karnataka	Dharwad	13
Hardoi	Uttar Pradesh	Hardoi	12

Himatnagar	Gujarat	Sabarkantha	12
Shimoga	Karnataka	Shimoga	12
Gangavalli	Tamil Nadu	Salem	11
Banswada	Telangana	Nizamabad	11
Keshkal	Chattisgarh	Bastar	10
Kallur	Telangana	Khammam	10
Somvarpet	Karnataka	Madikeri(Kodagu)	10
Derol	Gujarat	Panchmahals	10
Gonda	Uttar Pradesh	Gonda	10
Beawar	Rajasthan	Ajmer	10
Holenarsipura	Karnataka	Hassan	10
Vaduj	Maharashtra	Satara	10
Kustagi	Karnataka	Koppal	10
Bowenpally	Telangana	Hyderabad	9
Siddipet	Telangana	Medak	9
Fatehnagar	Rajasthan	Chittorgarh	9
Aligarh	Uttar Pradesh	Aligarh	9
Rahata	Maharashtra	Ahmednagar	9
Kondagoan	Chattisgarh	Bastar	9
Khair	Uttar Pradesh	Aligarh	9
Piriya Pattana	Karnataka	Mysore	8
Vadali	Gujarat	Sabarkantha	8
Husnabad	Telangana	Karimnagar	8
Shikaripura	Karnataka	Shimoga	8
Rajula	Gujarat	Amreli	8
Antagarh	Chattisgarh	Narayanpur	8
Bandhabazar	Chattisgarh	Rajnandgaon	8
Sangarapuram	Tamil Nadu	Villupuram	8
Holalkere	Karnataka	Chitradurga	8
Nagarkurnool	Telangana	Mahbubnagar	8
Badepalli	Telangana	Mahbubnagar	8
Nawarangpur	Orissa	Nowarangpur	8
Arakalgud	Karnataka	Hassan	8
Nuzvid	Andhra Pradesh	Krishna	7
Dammapet	Telangana	Khammam	7
Savarkundla	Gujarat	Amreli	7
Sambalpur	Chattisgarh	Bastar	7
Gorakhpur	Madhya Pradesh	Dindori	7
Bijolia	Rajasthan	Bhilwara	7
Ulundurpettai	Tamil Nadu	Villupuram	7
Kallakurichi	Tamil Nadu	Villupuram	7
Ramanujganj	Chattisgarh	Surguja	6

Arasikere	Karnataka	Hassan	6
Nippani	Karnataka	Belgaum	6
Ichapuram	Andhra Pradesh	Srikakulam	6
Samsi	West Bengal	Malda	6
Dharwar	Karnataka	Dharwad	6
Achampet	Telangana	Mahbubnagar	6
Kota	Rajasthan	Kota	6
Sorabha	Karnataka	Shimoga	6
Soundati	Karnataka	Belgaum	6
Agar	Madhya Pradesh	Shajapur	5
Makdi	Chattisgarh	Bastar	5
Doddaballa Pur	Karnataka	Bangalore	5
Jhabua	Madhya Pradesh	Jhabua	5
Bhiloda	Gujarat	Sabarkantha	5
Beed	Maharashtra	Beed	5
Haveri	Karnataka	Haveri	5
Mahbubnagar	Telangana	Mahbubnagar	5
Jabalpur	Madhya Pradesh	Jabalpur	5
Gondal	Gujarat	Rajkot	5
Yemmiganur	Andhra Pradesh	Kurnool	5
Channagiri	Karnataka	Davangere	5
Hirekerur	Karnataka	Haveri	5
Devgadhbaria	Gujarat	Dahod	5
Virudhachalam	Tamil Nadu	Cuddalore	5
Sitapur	Chattisgarh	Surguja	4
Chaurai	Madhya Pradesh	Chhindwara	4
Songadh	Gujarat	Surat	4
Nirmal	Telangana	Adilabad	4
Sahebganj	Jharkhand	Sahebgang	4
Gogamba	Gujarat	Panchmahals	4
Gowribidanoor	Karnataka	Kolar	4
Wanaparthy town	Telangana	Mahbubnagar	4
Amirgadh	Gujarat	Banaskanth	4
Derol(Adadara)	Gujarat	Panchmahals	4
Sillod(Bharadi)	Maharashtra	Aurangabad	4
Lucknow	Uttar Pradesh	Lucknow	4
Channarayapatna	Karnataka	Hassan	4
Dahod	Gujarat	Dahod	4
Sankeshwar	Karnataka	Belgaum	4

Manawar	Madhya Pradesh	Dhar	4
Davangere	Karnataka	Davangere	4
Pandharpur	Maharashtra	Sholapur	4
Ambagarh Chowki	Chattisgarh	Rajnandgaon	4
Baikunthpur	Chattisgarh	Koria	4
Jalgaon	Maharashtra	Jalgaon	4
Zaheerabad	Telangana	Medak	4
Ambikapur	Chattisgarh	Surguja	4
Jagtial	Telangana	Karimnagar	4
Raigarh	Chattisgarh	Raigarh	3
Koppal	Karnataka	Koppal	3
Bayad	Gujarat	Sabarkantha	3
Begu	Rajasthan	Chittorgarh	3
Chura	Chattisgarh	Raipur	3
Dondaicha	Maharashtra	Dhule	3
Vikarabad	Telangana	Ranga Reddy Dist.	3
Pathalgaon	Chattisgarh	Jashpur	3
Mundaragi	Karnataka	Gadag	3
Sangli	Maharashtra	Sangli	3
Madhugiri	Karnataka	Tumkur	3
Jamner	Maharashtra	Jalgaon	3
Arang	Chattisgarh	Raipur	3
Jaipur (Grain)	Rajasthan	Jaipur	3
H.B. Halli	Karnataka	Bellary	3
Bijapur	Karnataka	Bijapur	3
Segaon	Madhya Pradesh	Khargone	3
Chinnasalem	Tamil Nadu	Villupuram	3
Hirapur	Chattisgarh	Bastar	3
Tasgaon	Maharashtra	Sangli	3
Charama	Chattisgarh	Bastar	3
Sindagi	Karnataka	Bijapur	3
Hassan	Karnataka	Hassan	3
Sadasivpet	Telangana	Medak	3
Manasa	Madhya Pradesh	Neemuch	3
Chickkaballapura	Karnataka	Kolar	3
Karpawand	Chattisgarh	Bastar	3
Thalaivasal	Tamil Nadu	Salem	3
Mysore (Bandipalya)	Karnataka	Mysore	3
Talod	Gujarat	Sabarkantha	3
Bayad(Sadamba)	Gujarat	Sabarkantha	3

Khedbrahma	Gujarat	Sabarkantha	3
Koraput	Orissa	Koraput	3
Khetia	Madhya Pradesh	Badwani	3
Pratappur	Chattisgarh	Surguja	2
Nizamabad	Telangana	Nizamabad	2
Dhansura	Gujarat	Sabarkantha	2
Vellore	Tamil Nadu	Vellore	2
Chotila	Gujarat	Surendranagar	2
Anta	Rajasthan	Baran	2
Madhoganj	Uttar Pradesh	Hardoi	2
Mandsaur	Madhya Pradesh	Mandsaur	2
Bundi	Rajasthan	Bundi	2
Jhalrapatan	Rajasthan	Jhalawar	2
Pratapgarh	Rajasthan	Chittorgarh	2
Kapasan	Rajasthan	Chittorgarh	2
K.R.Nagar	Karnataka	Mysore	2
Mehar	Madhya Pradesh	Satna	2
Panruti	Tamil Nadu	Cuddalore	2
Hunsur	Karnataka	Mysore	2
Dudhani	Maharashtra	Sholapur	2
Jaspur	Chattisgarh	Jashpur	2
Thalavadi	Tamil Nadu	Erode	2
Gundlupet	Karnataka	Chamrajnagar	2
Faizabad	Uttar Pradesh	Faizabad	2
Kalagategi	Karnataka	Dharwad	2
Akluj	Maharashtra	Sholapur	2
Kalamb(Osmanabad)	Maharashtra	Osmanabad	2
Savanur	Karnataka	Haveri	2
Kurupam	Andhra Pradesh	Vijayanagaram	2
Jobat	Madhya Pradesh	Alirajpur	2
Nizar	Gujarat	Surat	2
Palitana	Gujarat	Bhavnagar	2
Villupuram	Tamil Nadu	Villupuram	2
Gajapathinagaram	Andhra Pradesh	Vijayanagaram	2
Jogipet	Telangana	Medak	2
Chikkamagalore	Karnataka	Chikmagalur	2
Haldwani	Uttarakhand	Nanital	2
Junagadh	Gujarat	Junagarh	2

Nira(Saswad)	Maharashtra	Pune	2
Shirur	Maharashtra	Pune	2
Udaipur	Rajasthan	Udaipur	2
Lonand	Maharashtra	Satara	2
Bhanupratappur	Chattisgarh	North Bastar	2
Pharasgaon	Chattisgarh	Bastar	2
Kharupetia	Assam	Darrang	2
Mhow	Madhya Pradesh	Indore	2
Deoulgaon Raja	Maharashtra	Buldhana	2
Kurdwadi	Maharashtra	Sholapur	2
Badwani	Madhya Pradesh	Badwani	2
Bededonger	Chattisgarh	Bastar	2
A lot	Madhya Pradesh	Ratlam	1
Sillod	Maharashtra	Aurangabad	1
Modasa	Gujarat	Sabarkantha	1
Indore	Madhya Pradesh	Indore	1
Nawabganj	Uttar Pradesh	Gonda	1
Bhokardan	Maharashtra	Jalana	1
Kasrawad	Madhya Pradesh	Khargone	1
Atrauli	Uttar Pradesh	Aligarh	1
Roorkee	Uttarakhand	Haridwar	1
Gamhari	Chattisgarh	Bastar	1
Mohol	Maharashtra	Sholapur	1
Shevgaon	Maharashtra	Ahmednagar	1
Shahada	Maharashtra	Nandurbar	1
Sira	Karnataka	Tumkur	1
Surajpur	Chattisgarh	Surguja	1
Metpally	Telangana	Karimnagar	1
Madanganj Kishanganj	Rajasthan	Ajmer	1
Konta	Chattisgarh	Dantewada	1
Dhamnod	Madhya Pradesh	Dhar	1

Bhadrachalam	Telangana	Khammam	1
Belur	Karnataka	Hassan	1
Sendhwa	Madhya Pradesh	Badwani	1
Gubbi	Karnataka	Tumkur	1
Ujhani	Uttar Pradesh	Badaun	1
Korar	Chattisgarh	North Bastar	1
Modasa(Tintoi)	Gujarat	Sabarkantha	1
Mahbubnagar(Nawabpet)	Telangana	Mahbubnagar	1
Digapahandi	Orissa	Ganjam	1
Gattasilli	Chattisgarh	Dhamtari	1
Karjat(Rashin)	Maharashtra	Ahmednagar	1
Armoor	Telangana	Nizamabad	1
Hoskote	Karnataka	Bangalore	1
Nagari	Chattisgarh	Dhamtari	1
Raichur	Karnataka	Raichur	1
Narela	NCT of Delhi	Delhi	1
Lohardaga	Jharkhand	Lohardaga	1
Katni	Madhya Pradesh	Katni	1
Aheri	Maharashtra	Gadchiroli	1
Anjad	Madhya Pradesh	Badwani	1
Kalvan	Maharashtra	Nashik	1
Charra	Uttar Pradesh	Aligarh	1
Narsampet	Telangana	Warangal	1
Badayoun	Uttar Pradesh	Badaun	1
Bhiknoor	Telangana	Nizamabad	1
Dausa	Rajasthan	Dausa	1
Pitlam	Telangana	Nizamabad	1
Boothapadi	Tamil Nadu	Erode	1
Saunsar	Madhya Pradesh	Chhindwara	1
Raghogarh	Madhya Pradesh	Guna	1
Thirukovilur	Tamil Nadu	Villupuram	1
Gariyaband	Chattisgarh	Raipur	1
Kanakapura	Karnataka	Bangalore	1
Gandhwani	Madhya Pradesh	Dhar	1

Nabarangpur(Umerkote)	Orissa	Nowarangpur	1
Pillukhera	Haryana	Jind	1
Kopargaon	Maharashtra	Ahmednagar	1
Suryapeta	Telangana	Nalgonda	1
Aklara	Rajasthan	Jhalawar	1
Pachaur	Madhya Pradesh	Rajgarh	1
Atru(Kawai Salpura)	Rajasthan	Baran	1
Annigeri	Karnataka	Dharwad	1
Bodhan	Telangana	Nizamabad	1
Barshi	Maharashtra	Sholapur	1
Manmad	Maharashtra	Nashik	1
Warangal	Telangana	Warangal	1
Athani	Karnataka	Belgaum	1
Gokak	Karnataka	Belgaum	1
Jamner(Neri)	Maharashtra	Jalgaon	1
Thattanchavady	Pondicherry	Pondicherry	1
Bhatapara	Chattisgarh	Raipur	1
Khanna	Punjab	Ludhiana	1
Ahmednagar	Maharashtra	Ahmednagar	1
Betnoti	Orissa	Mayurbhanja	1
Harsood	Madhya Pradesh	Khandwa	1
Pakur	Jharkhand	Pakur	1
Rajam	Andhra Pradesh	Srikakulam	1
Sindhanur	Karnataka	Raichur	1
Mundgod	Karnataka	Karwar(Uttar Kannad)	1
Bastar	Chattisgarh	Bastar	1
Kunkuri	Chattisgarh	Jashpur	1
Badnawar	Madhya Pradesh	Dhar	1
Parvathipuram	Andhra Pradesh	Vijayanagaram	1
Santhesargur	Karnataka	Mysore	1
Ariyalur Market	Tamil Nadu	Ariyalur	1
Soyatkalan	Madhya Pradesh	Shajapur	1
Kothagudem	Telangana	Khammam	1
Akola	Maharashtra	Akola	1

Latur	Maharashtra	Latur	1
Jamnagar	Gujarat	Jamnagar	1
Jangaon	Telangana	Warangal	1
Koraput(Semilguda)	Orissa	Koraput	1
Bhawani Mandi	Rajasthan	Jhalawar	1
Beohari	Madhya Pradesh	Shehdol	1
Susner	Madhya Pradesh	Shajapur	1
Narayankhed	Telangana	Medak	1
Jhagadiya	Gujarat	Bharuch	1
Narsapur	Telangana	Medak	1
Achampet(Amrabad)	Telangana	Mahbubnagar	1
Aatpadi	Maharashtra	Sangli	1

Annexure-II: Recorded values of arrival, minimum, maximum and modal prices of maize are changed

State Name	Market Center Name	Variety	Date Arrival	Date Recorded A	Arrival A	Arrival B	Min A	Min B	Max A	Max B	Modal A	Modal B	Date Recorded B
Telangana	Badepalli	Local	2016-03-14	2016-03-14	3.5	2.5	1352	1381	1352	1414	1352	1381	2016-03-25
Andhra Pradesh	Bobbili	Other	2016-03-29	2016-03-29	11.5	34.6	1600	1500	1600	1500	1600	1500	2016-04-10
Andhra Pradesh	Bobbili	Other	2016-03-23	2016-03-23	122.8	119	1325	1325	1325	1325	1325	1325	2016-04-03
Andhra Pradesh	Bobbili	Other	2016-03-29	2016-03-29	11.5	34.6	1600	1500	1600	1500	1600	1500	2016-04-20
Madhya Pradesh	Chhindwara	Other	2016-04-13	2016-04-13	72.1	188.1	1250	1239	1295	1400	1270	1320	2016-04-24
Maharashtra	Devala	Yellow	2016-03-15	2016-03-15	13	36	1349	1385	1428	1450	1396	1425	2016-03-26
Telangana	Gangadhara	Hybrid	2016-04-22	2016-04-22	1	0.1	1300	1300	1300	1300	1300	1300	2016-04-24
Telangana	Jagtial	Hybrid	2016-04-13	2016-04-13	18.5	22	1375	1380	1420	1418	1400	1400	2016-04-24
Maharashtra	Jamner(Neri)	Deshi Red	2016-04-13	2016-04-13	1	1	4900	1325	5000	1340	4959	1332	2016-04-24
Telangana	Kallur	Local	2016-03-17	2016-03-17	51	34	1200	1200	1350	1300	1250	1250	2016-03-27
Telangana	Kesamudram	Local	2016-04-13	2016-04-13	15.2	201.3	1100	1100	1427	1427	1375	1375	2016-04-24
Maharashtra	Lasalgaon(Nip had)	Other	2016-03-21	2016-03-21	11	12	1351	1351	1456	1464	1450	1448	2016-03-31
Madhya Pradesh	Manasa	Other	2016-03-16	2016-03-16	14	13	1446	1446	1600	1600	1523	1523	2016-03-27
Maharashtra	Manmad	Other	2016-04-05	2016-04-05	2	1	1400	1400	1436	1432	1400	1400	2016-04-20

Maharashtra	Manmad	Other	2016-04-05	2016-04-05	2	1	1400	1400	1436	1432	1400	1400	2016-04-07
Telangana	Pargi	Local	2016-04-13	2016-04-13	0.1	0.1	1430	1455	1430	1455	1430	1455	2016-04-24
Telangana	Siddipet	Local	2016-04-02	2016-04-02	5	29.1	1400	1336	1450	1414	1430	1375	2016-04-13
Telangana	Siddipet	Local	2016-04-01	2016-04-01	9.5	15.2	1437	1437	1457	1457	1447	1447	2016-04-12
Telangana	Siddipet	Local	2016-03-21	2016-03-21	125.1	12.5	1455	1445	1474	1474	1460	1460	2016-03-31
Telangana	Siddipet	Local	2016-03-11	2016-03-11	16.7	14.1	1446	1430	1474	1488	1460	1470	2016-03-23
Karnataka	Soundati	Local	2016-03-30	2016-03-30	52	67	1340	1340	1450	1450	1380	1380	2016-04-10
Karnataka	Soundati	Local	2016-03-30	2016-03-30	52	67	1340	1340	1450	1450	1380	1380	2016-04-20