

## AGMARKNET Web Portal: Decision Support for Soyabean Storage

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### Introduction:

Storage of agricultural commodities has become critical due to imperfect coordination between supply and demand. Storage operations are necessary to bridge the time gap between periodic harvests and marketing. The Theory of Storage by Kaldor (1939), states that the spread between spot and futures prices is determined by fundamental supply-and-demand conditions. Market information web portal plays an important role for providing the commodities arrival, minimum price, maximum price & modal price. AGMARKNET web portal of Government of India displays such type of information display on free of cost. By accessing the data this research paper is prepared to conclude whether farmers get more price in storage of Soyabean in warehouse or taking loan from the bank by producing godown receipt.

### 1.1 Objectives of the Research Paper:

1. To prepare decision support for storage of Soyabean by accessing data from AGMARKNET.
2. To apply the Bayes' Theorem for decision making.
3. To compare the storage cost with loan on storage.

### 1.2 Data Collection :

Data is collected from AGMARKNET web portal from October, 2003 to January, 2011 for Buldana District.

### 1.2.1 Statistical Test:

Data is accessed and stored in Micro Soft Excel Program and by using functions like sum, average and product Bayes' theorem applied.

### 1.2.2 Bayes' Theorem:

Bayes' theorem is a method to compute a revised probability of an event obtained after getting additional information which is called posterior probabilities (conditional probabilities under statistical dependence). "The Bayes' theorem is useful in revising the original probability estimated of known outcomes as we gain additional information about these outcomes. The prior probabilities, when changed in the light of new information, are called revised or posterior probabilities."

### 1.3 Statistical Decision Theory:

Statistical decision theory is used in decision making, "making of a decision requires an enumeration of feasible and viable decision alternatives (course of action or strategies), the projection of economic consequences

associate with different alternatives, the use of subjective as well as objective interpretations of probabilities concerning random events, and a measure of effectiveness (of an objective) by which the most perfect decision alternative is identified. Statistical decision theory provides an analytical and systematic approach to the study of decision-making wherein data concerning the occurrence of different outcomes (consequences) may be evaluated to enable the decision-maker to identify the suitable alternative (or course of action)." "Statistical decision theory comprises a number of quantitative techniques that greatly facilitate us in analyzing a decision situation. Further, they enable us to decide the best possible course from amongst the several alternatives available under given circumstances of the problem."

### 1.3.1 Decision Tree Analysis:

Decision tree analysis gives the solution for a problem by pictorial way. "Decision Tree analysis involves the construction of a diagram showing all the possible course of action, states of nature, and probabilities associated with the states of nature. The decision diagram looks very much like a drawing of a tree, therefore also called decision-tree. A decision tree consists of nodes, branches, probability estimates and payoffs." "In a sense, a decision tree is a good psychological tool. People are often consumed about decisions. They are not always perfectly aware of what they can do and what they cannot do, and they often lack of an understanding of uncertainty and how it affects the outcomes of their decisions."

### 1.4 Storage Facility in the Buldana District:

Buldana Urban Co-operative Credit Society is mainly providing warehouse facility in the Buldana District of Maharashtra. It is the largest co-operative credit society in India. "Buldana Urban initiated 'micro finance', a facility that supported and transformed countless common lives. It went beyond just finance to enrich and empower the common man, with an array of socio-economic activities. It took co-operative movement to the grass root level and utilized it to uproot problems. By procuring secured finance to the farmers and offering solutions to their problems such as storage and distribution of their products, Buldana Urban gave them economic stability and confidence. .... While aiming at world class, technology driven performance,

the Society nurtures a deep sense of accountability and social responsibility. For above all, it is a bank with a human touch!" ([http://www.buldanaurban.org/about\\_us.html](http://www.buldanaurban.org/about_us.html)). The Bank provides loans on warehouse receipt @ 13% p.a. ([http://www.buldanaurban.org/loans\\_and\\_advances.html](http://www.buldanaurban.org/loans_and_advances.html)) to the farmers. Under the Gramin Godam Yojana Gramin Godam Yojana, Buldana Urban has constructed 280 Godams at 22 places across Maharashtra. The huge storage capacity of these godams enables the farmer sell his products at a profitable rate. It also fosters producer-to-consumer process without the interference of the middle man. The scheme 'Godam at every gram' was appreciated by the Co-operative Department of Maharashtra (<http://www.buldanaurban.org/highlights.html>). The huge/great capacity of the Godams is like a boon to the farmer as these Godams allow the farmers to wait till he gets the proper value for his goods."

#### **1.4.1 Rural Warehouse Receipt Finance :**

"Buldana Urban was the first UCC to introduce pledge loan against agriculture produce called Rural Warehouse Receipt Finance Scheme (RWRf). This is the most successful example of Buldana Urban's response to members' needs. As soon as crops are harvested, farmers are often forced to sell them immediately, partly due to lack of storage facilities and partly due to pressing need for funds. The RWRf scheme of Buldana Urban addresses both these problems in one go by providing a secure warehouse for storage and a loan against the produce so stored. After the peak harvesting season is over, prices of these commodities start soaring and farmers can earn extra profits by such deferred sales, even after paying for interest and warehousing charges. Stalling with a single warehouse in 2001, Buldana Urban now has a network of approximately 175 warehouses spread over the hinterlands of all agriculturally important districts of Vidarbha. Every year about 25,000 members get the benefit from the warehousing facilities and about Rs. 200 crores of credit is disbursed against warehouse receipts. ... Its innovative loan products like Agri Implement Pledge Loan and Rural Warehouse Receipt Finance have not only helped several farmers to stay away from the clutches of usurious money lenders but also to earn some extra profit from their farming activities. This is the most significant impact of Buldana Urban on the membership community as Vidarbha region has become infamous for farmer's suicides resulting from agrarian distress mainly caused by debt traps of private moneylenders. Its livelihood enhancement initiatives have helped several farmers to find alternative income avenues, thereby reducing a dependence on the traditional cotton economy." It is estimated that about 15 per cent of the total foodgrain production is lost on-farm because ad-

equate warehouses are not located near production centres. Warehousing facilities are necessary to prevent losses arising out of improper storage, and also to provide the farmers a convenient credit instrument. Warehousing provides withholding power to farmers to tide over difficulties and helps them to secure better prices for their produce, cushioning price fluctuations and stabilizing prices by equating supply with demand. Modernization of existing warehousing space and investment in large, modern, scientifically-built and managed warehouses is required. The physical and transaction costs of storing grain is high. This can be partly explained by low private investment in storage facilities, and also high storage costs in the non-privatized storage silos. Currently, the rural godowns scheme provides credit-linked subsidy of 25% of the capital cost, with a ceiling of Rs. 46.8 lakhs. Farmers could avail of pledge loan by storing their produce in private warehouses. Government will provide credit-linked interest subsidy to the extent of 5% on the pledged loan, which is currently 10-12% per year, for 5 years to encourage farmers to use accredited warehouses. ([http://www.medcindia.org/agro % 20 Industriai % 20 policy. pdf](http://www.medcindia.org/agro%20Industriai%20policy.pdf)).

#### **1.4.2 Precautions for Storage:**

The monthly rate of rent to store soybean in the Buldana Urban Co-operative Credit Society's warehouse is Rs. 4/- per quintal/bag. Following are the precautions while taking Warehouse on Rental Basis.

1. There should not be leakage from Roof, Walls and Base.
2. Construction of warehouse should be completed as per the criteria of Construction Department.
3. Warehouse should be airy, with well sunlight.
4. Construction should prevent loss from animals like mouse.
5. Windows should be closed while fumigation.
6. There should be proper arrangements for road to reach warehouse. Drainage system should be proper.
7. Warehouse should be secured from fire, theft etc.
8. Tin shed should be leakage proof.
9. Base of warehouse should be hard, shutter should open inside.
10. Base of warehouse must be 3 to 4 inches in height from ground level.
11. Roof of warehouse should be with slope.
12. There should be wall compound and wire compound for warehouse.
13. Area of warehouse should be cleaned.

#### **1.5 Data from AGMARKNET Web Portal for Loan Option :**

Table No. 1 demonstrates that yearly data is collected from AGMARKNET web portal from the year 2003-04 for loan option and average is taken of the three month i.e. November, December and January every year. Price of October is considering for calculation. Loan is assumed by Buldana Urban Credit Society at the rate 13% p.a. on the 70% of the price for the month of October. Godown rent is Rs. 4/- per month per Quintal or Sack and

Loading and unloading charges (Hamali) Rs. 10/-

**1.6.Data from AGMARKNET Web Portal for Godown Option:**

Table No. 2 shows that yearly data is collected from AGMARKNET web portal from the year 2003-04

**Table No. 1 Yearly Data Collected from AGMARKNET Web Portal for Godown Option**

Year	First Month	Second Month	Third Month
2003-04	0.123	0.237	0.310
2004-05	0.114	0.111	0.063
2005-06	-0.018	-0.017	0.030
2006-07	0.108	0.128	0.153
2007-08	0.056	0.143	0.250
2008-09	0.007	0.072	0.278
2009-10	0.148	0.146	0.074
2010-11	0.022	0.033	0.124
Average	0.070	0.106	0.160

for loan option and average is taken of the three month i.e. November, December and January every year. Price of October is considering for calculation. Godown rent of the warehouse of Buldana Urban Credit Society is Rs. 4/- per month per Quintal or Sack and Loading and unloading charges (Hamali) Rs. 10/-.

**1.7 Interpretations:** 1. Table No. 3 shows that in stor-

**Table No. 2 Yearly Data Collected from AGMARKNET Web Portal for Loan Option**

Year	First Month	Second Month	Third Month
2003-04	0.028	0.039	0.050
2004-05	0.027	0.039	0.050
2005-06	0.028	0.039	0.051
2006-07	0.028	0.039	0.050
2007-08	0.024	0.034	0.044
2008-09	0.024	0.034	0.044
2009-10	0.022	0.032	0.041
2010-11	0.022	0.032	0.041
Average	0.025	0.036	0.046

**Table No. 3 Loan Option**

Event (E)	Prior P (E <sub>i</sub> )	Conditional P (E <sub>i</sub>  E <sub>j</sub> )	Joint P (E <sub>i</sub> E <sub>j</sub> )	Posterior P (E)	Profit	Loss
First Month (E1)	0.308	0.025	0.008	0.077	32.71	29.92
Second Month (E2)	0.335	0.036	0.036	0.354	195.74	56.07
Third Month (E3)	0.357	0.046	0.057	0.569	313.20	96.08
Total	1		0.100	1	541.64	182.07

**Table No. 4 Godown Option**

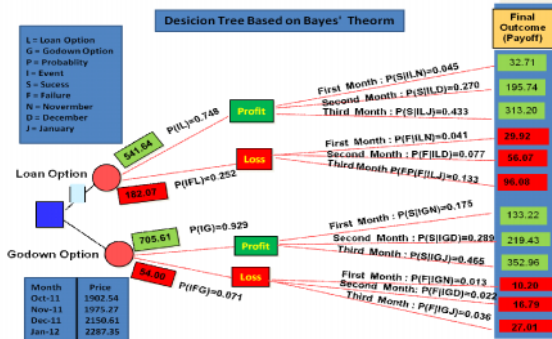
Event (E)	Prior P (E)	Conditional P (E <sub>i</sub>  E <sub>j</sub> )	Joint P (E <sub>i</sub> E <sub>j</sub> )	Posterior P (E <sub>i</sub> E)	Profit	Loss
First Month (E1)	0.308	0.070	0.022	0.189	133.22	10.20
Second Month (E2)	0.335	0.106	0.036	0.311	219.43	16.79
Third Month (E3)	0.357	0.160	0.057	0.500	352.96	27.01
Total	1		0.114	1.000	705.61	54.00

age with loan facility option 44.40% posterior probabil-

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ity (Rs.313.20/-) is finding compared with 35.70% prior probability which is grater on loss of Rs. 96.08 for third month.2. As per Table No., 50% posterior probability is finding in godown profit option (Rs.352.96/-) compared with 35.70% prior probability which is grater on loss of Rs. 27.01 for third month.3. As per Bayes' theorem test proves that storage for three months is better option. 4. But as per researcher's opinion loan facility is better, as farmers get money and they can run their routing needs. Bank can get business.

**1.8 Conclusions:** The peak period of soyabean is from October to January, as arrival is high and hence the prices shrink; consequently, storage in the godown is the option but unfortunately farmers need money and they could not wait till the prices hike. There is loan facility available on producing the godown receipt. AGMARKET is the best portal for data collection to decide prior data for Bayes' theorem. Farmers can get benefit by storing soyabean for three months. Farmers get money and they can run their routing needs. Bank