

**RURAL GODOWNS  
How Beneficial are they as a Business Proposition?**

**K. P. Reddy  
C. S. Murty**

**Food and Agri Business School  
S. V. V. R. Educational Society  
Chevella-Urella Road, Urella (PO)  
Chevella, Hyderabad, 500 503**

## **RURAL GODOWNS**

### **How Beneficial are They as a Business Proposition?**

#### **1. Introduction:**

The inadequacy of godowns to store agricultural produce is felt for a long time now. Scientific storage facilities are necessary for two specific reasons: one, for preventing/reducing storage losses and two for enabling the farmers to store their produce for sometime and thereby secure a price higher than that prevails immediately after the harvest.

It is variously estimated that the loss associated with private traditional storage structures is between 7 to 15 percent of the produce stored per year. If we consider the storage losses faced by the Food Corporation of India they will be even more for the reason that the food grains procured by the agency are at times stored in the open, for want of scientific storage space. It is not merely the quantitative losses that are staggeringly high. Qualitative losses in storage are high too. The urine, pellets and hairs dropped by rodents in the grains can be cancer causing. Because of these reasons the Supreme Court of the country in the recent past viewed that it is better to distribute food grains free of charge to the poor rather than allow the grains to perish in the open.

Farmers, both small and large, are forced to sell their produce soon after harvest for want of storage space. In the process they are deprived of obtaining a remunerative price for their produce. Even if storage facilities are available, the small farmers, many a time, do not utilise them for they have to raise revenues, soon after harvest, by selling the produce, to meet their pressing financial requirements (such as to finance investment in the next agricultural season, to repay debts etc). They are, therefore, found to indulge in distress sale of the produce. To get over this problem, it is necessary to not only create more storage space but also make arrangements to provide pledge loans on hypothecation of their produce stored in godowns.

Realising the importance of creating scientific storage space, *Gramin Bhadran Yojana*, a central sector scheme, was started in 2001-02 for

construction and renovation of rural godowns. After an appraisal of the Scheme in 2007, it is approved for implementation during 2007-12. The objective of the Scheme is to create scientific storage capacity with allied facilities in rural areas to meet the requirements of farmers for storing farm produce, processing farm produce, promoting grading, preventing distress sale etc. Subsidy is extended for the construction of godowns. The subsidy under the Scheme is linked to institutional credit and will be available to projects financed by commercial banks, regional rural banks, state cooperative banks, state cooperative agricultural and rural development banks, agricultural development finance companies, urban cooperative banks etc. The subsidy given varies between 25% to 33.33%. The farmers keeping their produce in the godowns are eligible to avail pledge loan on hypothecation of their produce. The National Bank for Agriculture and Rural Development (NABARD) provides refinance for construction of godowns and for pledge loan. The National Cooperative Development Corporation (NCDC) finances the cooperatives for construction and renovation of godowns.

An evaluation of the Scheme done in 2006 shows that it has created significant storage capacity, prevented distress sale of produce, reduced loss in quantity and quality of produce stored and created additional employment opportunities. It is found that the farmers storing their produce in the storage structures were able to enjoy between 5 to 15% increase in prices for their produce.

## **2. Objectives of the Study:**

As noted, those storing the produce in the godowns and selling it much later after harvest are able to secure prices higher than those obtaining soon after harvest. It is, however, not clear whether the users of godowns gain on a net basis, that is, after making allowance for storage cost, labour and transport costs involved in storing the produce, insurance charges payable on the stored produce, weight loss due to drying up of the produce while in storage and the interest cost on the pledge loans. The study addresses itself to these little explored areas. Next, while the godown owners derive returns in the form of storage charges paid by the godown users, they have to contend with the interest costs on the owned and

borrowed funds invested in the construction and maintenance of the structures. So, one needs to examine the extent to which the construction of godowns is a beneficial business proposition.

Thus, the specific objectives of the study are:

- a. To estimate the imputed and paid-out costs incurred by the owners/users of godowns.
- b. To arrive at the returns accruing to the owners/users of godowns.
- c. To examine as to how beneficial it is to own/use godowns based on an assessment of the returns net of costs.

### **3. Hypotheses:**

The study seeks to test the following hypotheses:

- a. The return on investment (involved in the construction and maintenance of godowns), net of costs, accruing to the godown owners is positive.
- b. Even after allowing for all the possible costs associated with storage, the farmers storing the produce in godowns receive prices higher than the post harvest prices.

### **4. Methodology:**

This paper is based on a pilot study conducted in Nandyala town of Kurnool district of Andhra Pradesh. It covered 5 godown owners and 27 godown users of the town. The sample of godown owners was chosen randomly from among the 28 godown owners of the town. As to the godown users, the sample was again drawn randomly but from among the users who availed godown facilities to store their paddy output between December 2009 and November 2010. Separate schedules were administered to the godown owners and users and the survey was undertaken in the month of December 2010.

The paper is organised as follows. In the following Section 5, we analyse the costs and returns of godown owners. Here, we purport to arrive at the rate of return on investment in godowns. Section 6 deals with details on godown users. Here, we juxtapose the costs and returns from storage with the aim to examine if it is at all beneficial for the users to store their produce in godowns. In Section 7, we present the conclusions emerging from the study.

## **5. Net Return from Investment in Godowns to their Owners:**

### ***(A) Cost Structure of Godowns:***

The godowns of Nandyala town were largely used for storing paddy. The other crops stored in the godowns were jowar, Bengal gram and sunflower seeds. The godowns here were constructed with funds from SBI, SBH and Andhra Bank and a subsidy of 25% was available to the godown owners on the loans contracted by them for the construction of godowns. As per the arrangement, loan was available from the commercial banks only for the construction of the godowns against the security of land. No loan was provided to procure the land needed to construct the godowns. Even the funds necessary for the construction of the compound wall surrounding the godown were to be supplied by the owner himself.

From the details elicited from the selected godown owners, we understand that the average capacity of a godown was 6,680 MT. The practice usually was to store the produce in gunny bags of 75 kg each. Thus, the average capacity of the godown works out to 89,067 bags. At the time of our survey in December 2010, average capacity utilisation of the godowns was estimated at 81%, that is, 5,411 MT or 72,144 bags (Table 1). This high rate of capacity utilisation is a pointer to the potential that exists for expanding the storage capacity.

The investment going into the construction of godowns was quite large. It is estimated that the total cost of construction of a godown was Rs. 155.2 lakh on an average. Both borrowed funds and owned resources went into the construction of godowns. In the total cost of construction, the borrowed funds comprised 58.51% or Rs. 90.8 lakh and owned funds 41.49% or Rs. 64.4 lakh. There was a subsidy component of 25% in the borrowed funds amounting to Rs. 24.6 lakh. Thus, the loan net of subsidy amounted to Rs. 66.2 lakh, on an average. Besides, the owners of the godowns, on an average, had to provide for owned funds to the tune of Rs. 33.2 lakh and land valued at Rs. 31.2 lakh for the construction of godowns (Table 1). Thus, the total cost of godown inclusive of both paid-out and imputed costs but exclusive of subsidy would be Rs. 130.6 lakh.

The interest rate payable on the loan amount of Rs. 66.2 lakh averaged 10.4%. The interest charges on the loan per year would therefore be Rs. 6,88,480. This amount constitutes the cost of borrowed funds. The imputed interest charges on owned funds need also to be added to this, to arrive at the cost of capital invested in godowns. If the cost of owned funds of Rs. 64.4 lakh are assessed at the interest rate 10.4% charged by the banks, the interest charges work out to Rs. 6,69,760 per year. Alternatively, if the owned funds are valued at the interest rate of 24% ruling in the informal credit market of the region, the interest charges amount to Rs. 15,45,600 per year. Thus, the interest charges due to the bank loans and those due to owned funds work out to Rs. 13,58,240 at the bank interest rate of 10.4%. These charges amount to Rs. 22,34,080 under variable interest rates, that is, if we employ 10.4% interest rate on the bank loans and 24% on the owned resources (Table 2).

In addition to the interest charges, the godown owners also incurred operating expenses due to wages paid to staff (including godown managers, watchmen, and sweepers), electricity charges and fumigation charges. These charges together amounted to Rs. 3,01,440 per godown per annum (Table 2).

The annual total cost of operating a godown, therefore, worked out, on an average, to Rs. 16,59,680 (13,58,240 + 3,01,440) under the bank rate of interest and Rs. 25,35,520 (22,34,080 + 3,01,440) under variable interest rates. These costs need to be pitted against the returns to arrive at the net rate of return on investment in godowns.

***(B) Returns from Godowns:***

The returns from godowns depend upon the godown capacity, the capacity utilised in the godown and the storage charges. As noted above, the average godown capacity was 89,067 bags (each of 75 kg). It is understood that 81% of this capacity was utilised at the time of survey. That is, on an average 72,144 bags were stored in the godown. Expecting the capacity utilisation to remain at this level over the year, we may estimate the returns from the godown, given the storage cost to be Rs. 4 per month per bag (of paddy). Thus, returns to the godown owner amounted to Rs. 2,88,576 per month or Rs. 34,62,912 per year.

Should the structure of the returns remain the same over the years, the pay back period of investment will be incredibly short at 3.77 years.

***(C) Rate of Return on Investment:***

We are now set to arrive at the rate of return on investment. The annual average total returns from a godown, as noted above was Rs. 34,62,912. The annual total cost of operating the godown was Rs. 16,59,680 or Rs. 25,35,520 depending upon whether we use 10.4% or 24% to impute the cost of owned funds invested in godowns. Thus, the corresponding annual returns net of costs respectively would be Rs. 18,03,232 or Rs. 9,27,392. The rate of return on investment (that is, the annual net return as a percentage of annual total cost of operating a godown) would thus work out respectively to 108.65% or 55.88%.

The rate of return from investment in godowns is, therefore, very high and vindicates our hypothesis. There is no unhealthy competition either among the godown owners. The amicable relations between the godown owners of the area were facilitated by the formal association they formed into. One expects that the present high rate of return would draw many new investors into creating additional storage facilities in future.

**6. Net Return from Godowns to their Users:**

***(A) Costs of Storage:***

It must be noted at the outset that some of the godown users were actually the traders storing the produce in the names of the farmers to evade legal provisions preventing hoarding. The number of persons using any single godown averaged 230 in December 2010. The number of bags of paddy stored by them ranged between 116 and 592 bags and the average number of bags stored was 294 bags. A classification of the godown users by size-class of bags stored shows that majority of the users, 11 out of 27, stored between 200 and 299 bags of paddy and they stored about a-third of the total bags stored by the sample respondents (Table 3).

Almost all the farmers storing their produce were doing so in the months of December 2009 – January 2010. What they stored was the kharif output of 2009. As much as 85.05% of the bags stored by the respondents were stored in

these two months (Table 4). The storage period ranged from 4 months to 12 months and the average period of storage was 7.22 months. There was no particular pattern shown by the godown users as to the storage period – that is, for those storing in both small and large quantities, the average period of storage was around 7 months (Table 6).

By not selling the produce soon after harvest and storing it for some time, farmers stand to make a gain in the price received. However, there are costs associated with storing the produce in the scientifically designed godowns. These costs include both fixed and variable costs. The fixed costs are the same irrespective of the storage period. They are (i) transport cost incurred in taking the produce to the storage structure, (ii) insurance charges on the produce stored and (iii) labour cost incurred in storing the produce in the godown. The variable costs are those which change with the period of storage – the longer the period of storage the more will be the costs. The variable costs are (i) weight loss due to drying up of the produce while in storage and (ii) the cost for storing the produce per se.

The transport cost was the most significant of the fixed costs. It amounted to Rs. 12.16 on an average per bag of produce stored (Table 5). Every farmer taking his produce to store in the godown would incur this cost. It may be stated in the passing that the transport cost would be incurred only while storing the produce in the godown and not when it is withdrawn from the godown and sold, for then the cost would be borne by the trader purchasing the produce from the farmer. It is a one time cost and would be dependent upon the distance the produce is transported before it is brought to the storage structure but does not change with the duration of the storage period. It is noticed that the transport cost per bag did not vary much between those who store the produce in large quantities and those who store in small quantities (Table 5).

Next, insurance charges of Rs. 3 a bag were payable on the produce stored in godowns. It is also a one time payment and does not change with the period of storage. The third and the last of the fixed costs is the labour cost and it averaged Rs. 4.19 per bag (Table 5).



It is reported that there was a weight loss of paddy during the storage period and that amounted to 0.416 kg per month per bag (or 5 kg per annum per bag). This is a variable cost and increases with the storage period. We estimated the value of total weight loss taking into consideration the storage period. It amounted to Rs. 37.17 per bag for the storage period. The other variable cost is the storage cost per se. It was Rs. 4 per month per bag of paddy. The average storage cost came to Rs. 28.39 per bag for the storage period (Table 6). Note that the average total cost incurred by the users of godowns was Rs. 84.91 per bag of paddy. This is a significant figure and indicates that the users of godowns would benefit from storing the produce only if the price realised from the sale of the stored produce is higher than the post-harvest price by at least Rs. 84.91 per bag. Put differently, the users of godowns would gain from storing the produce only if they secure at least 11.03% hike in price over the post-harvest price of Rs. 769.64 per bag (given the average storage period of 7.22 months).

Our calculations show that the fixed costs associated with storing the produce formed 22.79 per cent of the total costs and the variable costs constituted the rest, 77.21 per cent. Within the fixed costs, transport costs constituted the bulk of the costs. And, among the variable costs, the proportion of costs due to weight loss was more than the storage cost (Table 7).

***(B) Returns from Storing the Produce:***

As noted, most of those storing the produce did so soon after harvest in December 2009 and January 2010. From the data on the date of storing the produce by the individual farmers, we estimated the average post-harvest price or, more accurately, the average price at the time of storing the produce. It amounted to Rs. 769.64 per bag of paddy. When the stored produce was sold, the farmers realised a price of Rs. 940.63 per bag of paddy on an average (Table 8). A little over half of the stored produce (or 52.19%) was sold in 6 months or less (Table 9).

The average sale price did not seem to increase systematically either with the quantum of produce sold by any one farmer or with the increase in the

duration of storage period (Tables 8 and 9). It is evident that the trend increase in the price of paddy was highly uneven during the year 2010. As may be seen from above, the sale price was higher than the post-harvest price by Rs. 170.99 per bag of paddy that is by 22.22%. Obviously, this by itself does not indicate the reward for storing the produce. As seen above, the farmers have to contend with several costs during the period of storage. One has to account for these costs while making any assessment of reward to the farmer from storing the produce.

***(C) Net Gain Through Delayed Sale of Produce:***

The total net gain through delayed sale (that is, from holding the produce in godowns for some time) is arrived in two steps. First, we made an estimate of the net return through sale of stored produce by subtracting the total cost of storage from the total value of the produce at sale price. As a next step, we arrived at the total net gain through delayed sale by subtracting the total value of produce when it was stored from the total net return through sale of stored produce. The relevant calculations are shown in table 10. It is worth noting that all farmers, irrespective of the quantum of produce stored, made a net gain because of delayed sale.

The average net gain through delayed sale per bag of paddy sold is also arrived at in two steps (Table 11). The average return net of cost of storage per bag is arrived at and it is found to be Rs. 855.72. Those storing 500 bags or more secured the highest net return. And, the average net gain through delayed sale, that is estimated next, amounted to Rs. 86.08 per bag. Also, the average net gain through delayed sale as a percentage of average post-harvest price at the time of storage worked out to 11.18 on an average. Farmers selling both in small and in large quantities were able to secure a net gain by storing the produce in godowns for some time. Note, however, that the farmers storing 500 bags or more (ostensibly, the traders) recorded the highest net gain amounting to Rs. 219.07 per bag of paddy stored and the percentage of their gain was 28.44 (Table 11).

It is of import to note that the farmers obtained an average net gain of Rs. 86.08 per bag of paddy sold by holding the produce in godowns for an average

period of 7.22 months. While this is the reward for waiting, there is also a cost associated with waiting that is not accounted for in the above analysis. During the period when the produce was stored in godowns all the sample farmers hypothecated their produce and contracted loans from commercial banks. The average interest rate charged by the banks on loans against hypothecation of produce was 8.5%. This is a cost that the farmers had to contend with during the period they stored the produce. What should not be lost sight of is the margin requirement that the banks stipulate while advancing loans against hypothecation of the produce. We may calculate the margin money by subtracting the loans raised from commercial banks from the value of produce when it was stored (at post-harvest price). Had the farmers opted to sell off their produce soon after harvest they could have realised the full value of the produce, that is, the loan component and the margin money component. We need to attach a cost to the margin money component and this could be calculated using the bank rate of interest of 8.5% or the local market rate of interest of 24%.

To capture the cost associated with delaying the sale of produce, we depend on the interest charges (at the rate of 8.5%) the farmers paid for the loans they have contracted by hypothecating the produce stored in godowns and the interest charges they would have paid had they raised the margin money from the informal money market. The estimates of the interest costs due to bank loans raised and the imputed interest cost of margin money are given in table 12. These costs may be viewed as the interest costs of money tied up in stored produce. The details relating to the total discounted net gain or the total net gain through delayed sale minus interest cost of money tied up in stored produce for the period of storage are given in table 13.

The discounted net gain through delayed sale per bag of produce is calculated and the corresponding details are presented in table 14. The discounted net gain when the money tied up in stored produce is charged a uniform average interest rate of 8.5%, amounted to Rs. 46.71 per bag. Under variable interest rates, that is, if we employ 8.5% interest on bank loans and 24% on margin money, the discounted net gain is estimated at Rs. 33.30 per bag.

What is intriguing is the case of farmers storing 400 to 499 bags of produce. They in fact suffered a net loss because of storage, that is, when all costs are accounted for. And the farmers storing 500 or more bags of produce obtained the maximum net gain. The discounted net gain as a percentage of average post-harvest price at 8.5% interest rate was 6.07 and at the variable interest rates it was 4.33 (Table 14). However, our hypothesis that, after allowing for all costs (paid-out or otherwise), the farmers storing the produce in godowns receive prices higher than the post-harvest prices is not unexceptionally supported.

### **7. Conclusions:**

This pilot study sought to estimate the gains from rural godowns to their owners and to their users. Considering the case of the owners we found that the godowns were extremely beneficial to them in the sense that (1) the rate of return on investment in godowns was very high and (2) the pay back period of the investment in godowns on an average was merely 3.77 years. The high returns from godowns are sure to motivate many more people to invest in godowns in the near future.

When we examined beneficial nature of godowns to their users, we reached none too encouraging conclusions. So long as we did not discount the net gain from delayed sale of the produce for the money tied up in stored produce, the net gain was positive and reasonably high. But once we attached a cost to the money tied up in stored produce, it was seen that the farmers storing 400 to 499 bags of produce were experiencing a net loss – storing the produce proved a bane to them albeit marginally. The farmers storing produce of 500 bags and above secured a phenomenally large gain. We may note that the average sale price of stored produce did not increase systematically either with the quantity of produce stored or with the increase in the storage period. The observed uneven trend in the price of paddy is sure to dampen the spirits of those who wish to store their produce in godowns. Thus, we end up with some what mixed conclusions – investment in the construction of godowns is highly rewarding, but storing in them is fraught with occasional set backs.

Those who faced net loss in storage are those who sold their stored produce at inopportune time. Had they been properly guided they would have gained in the process of storing like most others. It means farmers need advisory. They should be made to know all the possible costs of storage, and based on that, the minimum price they should look for before they decide to sell the produce. Since the costs increase with increase in the period of storage, the minimum acceptable price too keeps increasing. It is therefore necessary that a government sponsored permanent advisory body is in place to guide the farmers. An effective advisory would prompt more farmers to go for storing the produce and that would contribute to stability in prices and more generally to food security. The advisory body when set up should ideally also be entrusted with the task of training the godown keepers in latest developments in scientific storage practices.

Table 1: Salient features of godowns

Sl. no.	Feature	Average per godown
1	Storage capacity:	
	Metric tonnes	6,680
	Bags (of 75 kg each)	89,067
2	Capacity utilisation:	
	Per cent	81.00
	Metric tonnes	5,411
	Bags (of 75 kg each)	72,144
3	Total cost of construction (Rs in lakhs):	155.20
	Of which:	
	(i) Borrowed funds:	
	Per cent in total cost of construction	58.51
	Amount (Rs in lakhs)	90.80
	(ii) Owned funds:	
	Per cent in total cost of construction	41.49
	Amount (Rs in lakhs)	64.40
4	Composition of borrowed funds:	
	(i) Subsidy component:	
	Per cent	25.00
	Amount (Rs in lakhs)	24.60
	(ii) Loan component:	
	Per cent	75.00
	Amount (Rs in lakhs)	66.20
5	Composition of owned resources:	
	(i) Owned funds:	
	Per cent	51.55
	Amount (Rs in lakhs)	33.20
	(ii) Imputed cost of land:	
	Per cent	48.45
	Amount (Rs in lakhs)	31.20

Table 2: Costs and returns from godowns

Sl. no.	Item	Average per godown
A	<b>COSTS:</b>	
1	Bank loan net of subsidy (Rs. in lakhs)	66.2
2	Average rate of interest charged by banks (%)	10.4
3	Annual interest charges on bank loan (Rs.)	6,88,480
4	Owned funds invested in godown construction (Rs. in lakhs)	33.2
5	Imputed cost of owned land used to construct godown (Rs. in lakhs)	31.2
6	Total of owned funds (4 + 5) (Rs.)	64.4
7	Annual interest charges on owned funds:	
	(i) At bank rate of interest of 10.4% (Rs.)	6,69,760
	(ii) At market rate of interest of 24% (Rs.)	15,45,600
8	Annual interest charges on bank loan and owned funds:	
	(i) At bank rate of interest of 10.4% (3 + 7(i)) (Rs.)	13,58,240
	(ii) At an interest of 10.4% on bank loan & at market interest rate of 24% on owned funds (3 + 7(ii)) (Rs.)	22,34,080
9	Annual maintenance cost of godown (Rs.):	
	(i) Wages to managers	1,74,000
	(ii) Wages to watchmen	42,000
	(iii) Electricity charges	12,240
	(iv) Fumigation charges	73,200
	(v) Total	3,01,440
10	Annual total operating costs of godown:	
	(i) At bank rate of interest of 10.4% (8(i) + 9 (v)) (Rs.)	16,59,680
	(ii) At an interest of 10.4% on bank loan & at market interest rate of 24% on owned funds (8(ii) + 9(v)) (Rs.)	25,35,520
B	<b>RETURNS:</b>	
11	Godown capacity (in bags of 75 kg each)	89,067
12	Capacity utilised (%)	81
13	Capacity utilised (bags)	72,144
14	Storage cost per bag per month (Rs.)	4
15	Returns from godown (Rs.):	
	(i) Per month	2,88,576

	(ii) Per year	34,62,912
16	Returns net of costs (Rs.)	
	(i) At bank rate of interest of 10.4% (15(ii) - 10 (i))	18,03,232
	(ii) At an interest of 10.4% on bank loan & at market interest rate of 24% on owned funds (15(ii) - 10(ii))	9,27,392
17	Annual net returns as % of costs (%):	
	(i) At bank rate of interest of 10.4% (16(i) as % of 10(i))	108.65
	(ii) At an interest of 10.4% on bank loan & at market interest rate of 24% on owned funds (15(ii) - 10(ii))	55.88

Table 3: Produce stored in godowns classified by the size-class of bags (75 kg) stored

Size-class of bags stored	No. of godown users	Total number of bags stored	% to total bags stored	Average no. of bags stored
Less than 100	0	0	0.00	0.00
100-199	6	956	12.04	159.33
200-299	11	2663	33.55	242.09
300-399	3	969	12.21	323.00
400-499	5	2258	28.45	451.60
500 & above	2	1092	13.76	546.00
Total	27	7938	100.00	294.00

Table 4: Produce stored in godowns classified by the month in which stored

Month/year in which produce was stored	No. reporting storing in the month	Output stored in bags	% to total bags stored	Average no. of bags stored
December 2009	12	3699	46.60	308
January 2010	10	3052	38.45	305
February 2010	3	634	7.99	211
March 2010	0	0	0.00	0.00
April 2010	1	196	2.47	196
May 2010	1	357	4.50	357
Total	27	7938	100.00	294

Table 5: Fixed costs incurred in storage classified by the size-class of bags stored

Size-class of bags stored	Transport cost to take produce to godown (Rs.)	Labour cost to store produce in godown (Rs.)	Insurance cost (Rs.)



	Total	Per bag	Total	Per bag	Total	Per bag
Less than 100	0	0.00	0	0.00	0	3
100-199	12452	13.03	3830	4.01	2868	3
200-299	28600	10.74	10712	4.02	7989	3
300-399	13000	13.42	3876	4.00	2907	3
400-499	31500	13.95	9450	4.19	6774	3
500 & above	11000	10.07	5368	4.92	3276	3
Total	96552	12.16	33236	4.19	23814	3

Table 6: Variable costs incurred in storage classified by the size-class of bags stored

Size-class of bags stored	Average storage period	Cost due to weight loss at 0.416 a month per bag for the storage period		Storage cost at Rs. 4 a month per bag for the storage period	
		Total	Per bag	Total	Per bag
Less than 100	0.00	0	0	0	0
100-199	7.33	34213	35.79	26824	28.06
200-299	7.73	108710	40.82	82560	31.00
300-399	4.33	20847	21.51	16704	17.24
400-499	8.40	95144	42.14	75044	33.23
500 & above	5.50	36122	33.08	24208	22.17
Total	7.22	295036	37.17	225340	28.39

Table 7: Total costs incurred in storage classified by the size-class of bags stored

Size-class of bags stored	Total variable cost	Total fixed cost	Total cost	Average total cost
Less than 100	0	0	0	0.00
100-199	61037 (76.12)	19150 (23.88)	80187 (100.00)	83.88
200-299	191270 (80.17)	47301 (19.83)	238571 (100.00)	89.59
300-399	37551 (65.50)	19783 (34.50)	57334 (100.00)	59.17
400-499	170188	47724	217912	96.51

	(78.10)	(21.90)	(100.00)	
500 & above	60330 (75.44)	19644 (24.56)	79974 (100.00)	73.24
Total	520376 (77.21)	153602 (22.79)	673978 (100.00)	84.91

Figures in brackets indicate the percentages to total cost.

Table 8: Total value of the stored produce at the post-harvest price and the sale price classified by the size-class of bags stored

Size-class of bags stored	Total no. of bags stored	Total value of produce when produce was stored	Ave. post-harvest price when produce was stored/bag	Total value of produce at sale price	Ave. price at which stored produce was sold/bag
Less than 100	0	0	0.00	0	0.00
100-199	956	743962	778.20	878437	918.87
200-299	2663	2041350	766.56	2506500	941.23
300-399	969	753525	777.63	872100	900.00
400-499	2258	1729388	765.89	2049263	907.56
500 & above	1092	841200	770.33	1160400	1062.64
Total	7938	6109425	769.64	7466700	940.63

Table 9: Average sale price of produce classified by the duration of the storage period

Duration of the storage period (during 2009 Dec and 2010 Nov)	Number reporting	Total no. of bags stored	Total value of produce at sale price	Ave. sale price per bag when output is sold
less than 5	6	1844 (23.23)	1668225	904.68

months				
5-6 months	7	2299 (28.96)	2280713	992.05
7-8 months	4	1017 (12.81)	899362	884.33
9-10 months	6	1600 (20.16)	1469850	918.66
11-12 months	4	1178 (14.84)	1148550	975.00
Total	27	7938 (100.00)	7466700	940.63

Table 10: Total net gain through delayed sale classified by the size-class of bags stored

Size-class of bags stored	Total value of produce at sale price	Total cost	Net return thro' sale	Total value of produce when it was stored	Total net gain thro' delayed sale
Less than 100	0	0	0	0	0
100-199	878437	80187	798250	743962	54288
200-299	2506500	238571	2267929	2041350	226579
300-399	872100	57334	814766	753525	61241
400-499	2049263	217912	1831351	1729388	101963
500 & above	1160400	79974	1080426	841200	239226
Total	7466700	673978	6792722	6109425	683297

Table 11: Net gain per bag because of storage (of delayed sale) classified by the size-class of bags stored

Size-class of bags stored	Ave. return per bag sold (ave. sale price)	Ave. total cost of storage per bag	Ave. return net of average cost of storage per bag	Ave. post-harvest price per bag when produce was stored	Ave. net gain thro' delayed sale per bag	Ave. net gain thro' delayed sale as % of ave. post-harvest price per bag at the time of storage
Less than 100	0.00	0.00	0.00	0.00	0.00	0.00
100-199	918.87	83.88	834.99	778.20	56.79	7.30
200-299	941.23	89.59	851.64	766.56	85.08	11.10
300-399	900.00	59.17	840.83	777.63	63.20	8.13
400-499	907.56	96.51	811.05	765.89	45.16	5.90
500 & above	1062.64	73.24	989.40	770.33	219.07	28.44
Total	940.63	84.91	855.72	769.64	86.08	11.18

Table 12: Interest charges due to bank loans raised and those due to margin money classified by the size-class of bags stored

Size-class of bags stored	Total value of produce when produce was stored	Total loan raised from commercial banks	Margin money = value of produce stored minus loan raised	Interest cost on loan for the period of storage @ r of 8.5%	Interest cost on margin money for the period of storage		Interest cost of money tied up in stored produce for the period of storage	
					@ r of 8.5%	@ r of 24%	@ r of 8.5%	@ r of 8.5% on bank loan + @ r of 24% on margin money
Less than 100	0	0	0	0	0	0	0	0
100-199	743962	612650	131312	31824	6821	19259	38645	51083
200-299	2041350	1655600	385750	90619	21114	59616	111733	150235
300-399	753525	599250	154275	18394	4735	13371	23129	31764
400-499	1729388	1445700	283688	86019	16879	47660	102899	133679

500 & above	841200	655200	186000	25526	7246	20460	32772	45986
Total	6109425	4968400	1141025	254170	58372	164815	312542	418985

Table 13: Total net gain and discounted net gain through delayed sale classified by the size-class of bags stored

Size-class of bags stored	Total net gain thro' delayed sale	Interest cost of money tied up in stored produce for the period of storage		Discounted net gain thro' delayed sale*	
		@ r of 8.5%	@ r of 8.5% on bank loan + @ r of 24% on margin money	@ r of 8.5%	@ r of 8.5% on bank loan + @ r of 24% on margin money
Less than 100	0	0	0	0	0
100-199	54288	38645	51083	15643	3205
200-299	226579	111733	150235	114846	76344
300-399	61241	23129	31764	38112	29477
400-499	101963	102899	133679	-936	-31716
500 & above	239226	32772	45986	206454	193241
Total	683297	312542	418985	370755	264312

\* Total net gain through delayed sale minus interest cost of money tied up in stored produce for the period of storage

Table 14: Discounted net gain through delayed sale per bag of produce stored and as a percentage of price of bag at the time of storage classified by the size-class of bags stored

Size-class of bags stored	Discounted net gain thro' delayed sale per bag		Ave. post-harvest price when produce was stored/bag	Discounted net gain thro' delayed sale as % of price per bag at time of storage	
	@ r of 8.5%	@ r of 8.5% on bank loan + @ r of 24% on margin money		@ r of 8.5%	@ r of 8.5% on bank loan + @ r of 24% on margin money
Less than 100	0.00	0.00	0.00	0.00	0.00
100-199	16.36	3.35	778.20	2.10	0.43
200-299	43.13	28.67	766.56	5.63	3.74
300-399	39.33	30.42	777.63	5.06	3.91
400-499	-0.41	-14.05	765.89	-0.05	-1.83
500 & above	189.06	176.96	770.33	24.54	22.97
Total	46.71	33.30	769.64	6.07	4.33

**References:**

For data on paddy prices in the study area – <http://agmarknet.nic.in>

For details on the *Gramin Bhandaran Yojana* -