

## **MODEL SCHEME FOR SETTING UP RURAL GODOWN**

### **INTRODUCTION**

India has become self-sufficient in food grains and achieved a remarkable growth in the production of pulses, oil seeds and fibres to meet the requirements of the country. Although our farming community toiled hard, the small and marginal segment of farmers could not get real benefit of the growth in the economy due to either non availability of adequate storage infrastructure within the vicinity of production areas poor access to the godowns. This situation has forced them to dispose the produce at farm gate at a price determined by the middlemen/merchants/commission agents. Only a handful of influential farmers who have the infrastructure to overcome the market fluctuations, could derive the benefits.

Further, as the small and marginal farmers, who generally remain outside the purview of formal financing institutions depends heavily on the borrowed money from money lenders for the agricultural operations. Not only the borrowings are at an unreasonably high rate of interest but they are forced to sell their produce immediately after the harvest at very low rate. Thus, the farmers lose heavily on their investments. This vicious cycle is recurring year after year making the farmers poorer. The creation of small storage facilities, through construction of grain godowns, having a capacity ranging from 50 MT to 250 MT in villages may be a remedy for the farmers, who not only can store their own produce, but also provide storage space for rentals. To such farmers who store their produce for rents should have access to pledge loan against warehouse receipts from financial institutions.

Therefore, the model scheme for setting up rural godown of small sizes in rural areas needs to be financed by the banks on larger scale so as to provide relief to the small and marginal segment of farmers, who remain vulnerable not only to the climate vagaries, but also to the market fluctuations.

### **REQUIREMENTS OF AN IDEAL GRAIN STORAGE STRUCTURE**

The object of an ideal grain storage structure is to control and reduce the storage losses from rodents, insects and micro-organisms, birds, moisture and heat to a minimum. In designing and constructing a storage structure following points shall be borne in mind:

1. All holes, pipes and ducts and other openings shall be guarded by suitable means, such as gratings, etc., in order to prevent the entry of rats and other vermin.
2. The structure shall have smooth, crack free internal surfaces and shall have no unnecessary cavities and projections to prevent the lodgment from insects and vermin. Periodical fumigation and other treatments should be done to eliminate infestation of grains by insects, fungus etc. The structure shall be designed so as to facilitate its sealing for fumigation or have facility to seal a portion where fumigation has to be carried out, or it may be made completely airtight if required.

3. Godowns should have good ventilation arrangement to prevent moisture accumulation in pockets.
4. The structure shall be designed to make it possible to control moisture. Moisture may be controlled by adopting methods of construction using non-hygroscopic material, by sound wall, roof and floor construction, by the use of vapour barriers, and by the use of aeration.
5. The structure shall be so oriented that it will receive the minimum solar radiation. Reflective external surfaces, insulating materials, sun shades, a minimum of glass surfaces, controlled ventilation and aeration, to reduce the internal temperature may be used.

### **CAPACITY AND DIMENSIONS**

- Small sized godowns : Capacity of 50, 100, 200 and 250
- Medium sized godowns: Capacity of 500, 1000 MT and 2000 MT.
- Large sized godowns: Capacity above 2000 MT.

For storage capacity of 1000 MT and above the godowns may be divided into suitable compartments, depending upon the availability of land.

The height of a road fed godown is 5.6m.

The ideal stack size shall be 9.15m X 6.1m X 4.57m.

### **LOCATION**

The structure shall be located on a raised well-drained site, not liable to flooding or inundation and it shall be away from a place likely to be affected by seepage water.

The construction of godowns in the residential areas should be avoided. In selecting the location, maximum attention should be paid to the hygienic and sanitary conditions of the area and the following minimum distances should be maintained:

Sl No	Units	Distance from godown
1	Kilns, bone-crushing mills, garbage-dumping grounds, slaughter-houses, tanneries and hide-curing centres or such other places, the vicinity of which is deleterious to the safe storage of food grains.	500m
2	Dairies and poultry farms	300m
3	Factories and other sources of fire such as workshops, hay stacks, timber stores and petrol pumps.	150m

There shall be no trees near the structure, the roots of which affect the foundation. The structure should be at least 3 m away from any branches of trees, poles etc. so as to avoid the access by rodents.

The godown premises should have adequate space for parking/manoeuvring of vehicles. The structure should preferably be situated near a transport head or a main road. If the structure is located in the interior, an approach road suitable for the movement of trucks and trollies shall be provided.

### **REQUIREMENTS OF AN IDEAL GRAIN STORAGE STRUCTURE**

The object of an ideal grain storage structure is to control and reduce the storage losses from rodents, insects and micro-organisms, birds, moisture and heat to a minimum. In designing and constructing a storage structure following points shall be borne in mind:

All holes, pipes and ducts and other openings shall be guarded by suitable means, such as gratings, etc., in order to prevent the entry of rats and other vermin.

The structure shall have smooth, crack free internal surfaces and shall have no unnecessary cavities and projections to prevent the lodgement from insects and vermin. Periodical fumigation and other treatments should be done to eliminate infestation of grains by insects, fungus etc. The structure shall be designed so as to facilitate its sealing for fumigation or have facility to seal a portion where fumigation has to be carried out, or it may be made completely airtight if required. Godowns should have good ventilation arrangement to prevent moisture accumulation.

The structure shall be designed to make it possible to control moisture. Moisture may be controlled by adopting methods of construction using non-hygroscopic material, by sound wall, roof and floor construction, by the use of vapour barriers, and by the use of aeration.

The structure shall be so oriented that it will receive the minimum solar radiation. Reflective external surfaces, insulating materials, sun shades, a minimum of glass surfaces, controlled ventilation and aeration, to reduce the internal temperature may be used.

Suitable drainage arrangements such as surface or underground drains to drain the rain water from the storage premises shall be made.

The necessary ancillary structures include office room, store room, chaukidar-cum-switch room, chaukidar quarters, isolation shed, lavatory block and sanitation installation, drinking water arrangement and fire fighting arrangement are required in case of godowns of capacity more than 1000 MT. For smaller godowns suitable ancillary structures may be selected as per needs.

## **Technical Specification of Civil Structure of a Godown**

### **PLINTH**

The plinth shall be generally kept about 80 cm above the finished ground level. Platforms should be provided along the length of the godown in order to facilitate loading and unloading. The minimum width of the platform should be 2.45 m for road-fed godowns. The platform should be provided with an outward slope of 1 in 40 in order to prevent the rain water from getting inside the godowns through the doors. The platforms shall be preferably covered.

Plinth shall be filled with good and selected earth in layers not exceeding 200 mm; each layer being watered, well rammed and consolidated. The finished level of filling shall be kept in slope intended to be given on the floor.

The plinth shall be constructed of either stone or brick masonry in lime mortar (1:2) or cement mortar (1:6). It shall be provided with damp proof course of well graded concrete with water proofing compound (a coat of residual petrol bitumen) to a minimum thickness of 40 mm on brick masonry and 50 mm on stone masonry.

A cement concrete or reinforced cement or stone slab projection of 15 cm to 18 cm at plinth level may be provided at 0.75 m to 0.8m plinth height so that rats and rodents will not be able to enter the godowns. Moveable steps are to be provided so that they can be pulled away from the godown entrances when not required.

### **Civil Structures**

Foundation, flooring, walls and roofs should conform the Central/State PWD specification and as per the norms of warehouse. The design of the walls shall be in accordance with the general constructional practices (IS: 1905-1969) and care shall be taken that the tensile stresses do not exceed the cracking limit. Roof shall be of single span structural steel or tubular trusses. These trusses shall be fixed on RCC or stone masonry or brick masonry pillars at a height of 5.60 m for the road-fed from the floor level to the tie level at the column ends.

### **VENTILATORS**

The ventilators shall be fixed 15 cm below the top edge of the wall measured from inside the godown. Adequate ventilations as per the norms of warehouse should be provided for air circulation inside the godown, which is required to keep the quality of materials stored in the godown.

### **CAPITAL INVESTMENT**

Capital cost will be about Rs. 2800 per MT for small capacity upto 2000 MT and Rs.2000/MT for godowns of capacity above 2000MT. This outlay is inclusive of the cost of land, land development, preliminary & preoperative expenses and miscellaneous provisions. The cost of land will be treated towards the margin

money. Under the land development, road, drainage, watch & ward provisions will be made.

### **INSURANCE**

The structure as well as the stored produce should be insured.

### **PACKAGE OF PRACTICES**

Various storage management practices like Dunnage, Rat proofing, anti termite treatment, fumigation, quality checks etc., are required to be followed.

### **Assumptions for financial analysis**

- 20% capacity shall be used for storage of own produce or own trading
- 70% capacity for rent
- Maximum capacity utilisation at 90%
- Average margin for own produce at Rs.200/bag of 75 kg
- Rent per bag of 75 kg at Rs.3.50/month
- Maximum storage for 10 months
- Financial analysis is considered for paddy storage
- Cost of construction – Rs.2800 per MT
- Bank Loan – 75%
- Interest rate – 12%
- Repayment period – 10 years with one year grace period

The cash flow statement, financial analysis and repayment schedule of 50 MT godown is worked out and presented in the following tables. A summary of results of financial analysis of 100 MT, 250 MT, 500 MT and 1000 MT godowns are given below:

<b>Particulars</b>	<b>IRR</b>	<b>NPW</b>	<b>DSCR</b>	<b>BCR</b>
100 MT	23%	0.62	2.04	1.33:1
250 MT	23	1.54	2.00	1.38:1
500 MT	23	3.08	2.18	1.42:1
1000 MT	23	6.17	2.32	1.48:1





**REPAYMENT SCHEDULE - 50 MT CAPACITY GRAIN STORAGE GODOWN****OUTLAY = Rs.1,40,000 Loan/ finance 75 % of the outlay**

Years	Beginning of the Year	End of the Year	Net Surplus	Payment of Interest @ 12 % p.a.	Repayment of Principal	(Rs.lakh) Total Outgo	Net Available	DSCR
1	1.05	1.05	-1.149	0.162	0	0.162		-7.09
2	1.05	0.95	0.296	0.162	0.1	0.262	0.034	1.13
3	0.95	0.85	0.319	0.114	0.1	0.214	0.105	1.49
4	0.85	0.75	0.319	0.102	0.1	0.202	0.117	1.58
5	0.75	0.65	0.319	0.09	0.1	0.19	0.129	1.68
6	0.65	0.55	0.319	0.078	0.1	0.178	0.141	1.79
7	0.55	0.45	0.319	0.066	0.1	0.166	0.153	1.92
8	0.45	0.3	0.319	0.054	0.15	0.204	0.115	1.56
9	0.3	0.15	0.319	0.036	0.15	0.186	0.133	1.72
10	0.15	0	0.319	0.018	0.15	0.168	0.151	1.90
		<b>Average DSCR</b>						<b>1.64</b>

**DISCLAIMER**

*The views expressed in this model project are advisory in nature. NABARD assume no financial liability for anyone using this project report for any purpose. The actual costs and returns will have to be taken on a case by case basis considering the specific requirements of projects.*