

Cold Storage for Plantation And Horticulture Produce

1. Introduction

India is the largest producer of fruits and second largest producer of vegetables in the world. In spite of that per capita availability of fruits and vegetables is quite low because of post harvest losses which account for about 25% to 30% of production. Besides, quality of a sizable quantity of produce also deteriorates by the time it reaches the consumer. This is mainly because of perishable nature of the produce which requires a cold chain arrangement to maintain the quality and extend the shelf-life if consumption is not meant immediately after harvest. In the absence of a cold storage and related cold chain facilities, the farmers are being forced to sell their produce immediately after harvest which results in glut situations and low price realization. Sometime farmers do not even get their harvesting and transportation costs what to talk of the cost of production or profit. As a result, our production is not getting stabilized and the farmers after burning fingers in one crop switch over to another crop in the subsequent year and the vicious cycle continues. Our farmers continue to remain poor even though they take risk of cultivating high value fruits and vegetable crops year after year. A cold storage facility accessible to them will go a long way in removing the risk of distress sale to ensure better returns. This document endeavors to provide information on various broad technical and financial aspects of a cold storage unit to enable the financing banks and entrepreneurs in formulation and implementation such projects.

2. Status of Cold storage and its potential in India

The estimated annual production of fruits and vegetables in the country is about 130 million tonnes. This accounts for 18% of our agricultural output. Due to diverse agro climatic conditions and better availability of package of practices, the production is gradually rising. Although, there is a vast scope for increasing the production, the lack of cold storage and cold chain facilities are becoming major bottlenecks in tapping the potential. The cold storage facilities now available are mostly for a single commodity like potato, orange, apple, grapes, pomegranates, flowers, etc. which results in poor capacity utilization. Present availability of cold storage capacity is only 103.5 lakh tonnes, out of which units having about 8 lakh tonnes capacity are non functional. Although 90% of these units are made to store only potato even then it does not meet the requirement of the single crop, the production of which is about 300 lakh tonnes. Out of 3443 cold storage units setup till 1988, 2012 units were for potato, 447 units were for multipurpose use, 198 units were for fruits and vegetables and the remaining were for products like meat, fish, milk, etc. The details of the commodity wise distribution of cold storage capacity is given in Table 1.

Table 1 : Commodity wise distribution of cold storage capacity

Commodity	Units	Capacity (lakh tonnes)
Potato	2,012	92.82
Multipurpose	447	7.63
Fruits & Vegetables	198	1.07
Meat	23	0.09

Fish	360	0.73
Meat & Fish	30	0.15
Milk & Dairy Products	272	0.68
Others	101	0.36

Of the above 3443 cold storage units, 2975 are in private sector, 303 are in cooperative sector and the rest are in public sector.

According to the information collected by the expert committee on cold storage and storage, requirement of cold storage in the next five years may be in excess of 12 lakh tonnes. The working group of the planning commission for IX plan had assessed new cold storage capacity for fruits, vegetables and multi commodity as 15 lakh tonnes; 13 lakh tonnes in private sector, 1.5 lakh tonnes in cooperative sector and the rest 0.5 lakh tonnes in public sector. Thus, there remains a vast potential to be tapped.

3. Storage of foods and Storage Conditions

Foods and many other commodities can be preserved by storage at low temperature, which retards the activities of micro organisms. Micro organisms are the spoilage agents and consist of bacteria, yeasts and molds. Low temperature does not destroy those spoilage agents as does high temperature, but greatly reduces their activities, providing a practical way of preserving perishable foods in their natural state which otherwise is not possible through heating. The low temperature necessary for preservation depends on the storage time required often referred to as short or long term storage and the type of product.

In general, there are three groups of products:

1. Foods that are alive at the time of storage, distribution and sale e.g. fruits and vegetables,
2. Foods that are no longer alive and have been processed in some form e.g. meat and fish products, and
3. Commodities that benefit from storage at controlled temperature e.g. beer, tobacco, khandsari, etc.

Living foods such as fruits and vegetables have some natural protection against the activities of micro organism. The best method of preserving these items is to keep the product alive and at the same time retard the natural enzyme activity which will retard the rate of ripening or maturity.

Preservation of non-living foods is more difficult since they are susceptible to spoilage. The problem is to preserve dead tissues from decay and putrefaction. Long term storage of meat and fish product can only be achieved by freezing and then by storing it at temperature below -15°C. Only certain fruits and vegetables can benefit from freezing. However, for fruits and vegetables one should be very careful about the recommended storage temperature and humidity a deviation from which will have adverse effect on the stored product leading to even loss of the entire commodity.

Products such as apples, tomatoes, oranges, etc. cannot be frozen and close control of temperature is necessary for long term storage. Some product can also be benefited by storing under controlled atmosphere and modified atmosphere conditions.

Dairy products are produced from animal fats and therefore non living foodstuffs. They suffer from the oxidation and breakdown of their fats, causing rancidity. Packaging to exclude air and hence Oxygen can extend storage life of such foodstuffs. The storage requirement of some of the important commodities are placed at Annexure I.

4. Economic size of unit and land requirements:

Cold storage units can be used to store either a single commodity or multiple commodities. Depending upon the entrepreneur's financial health; it can be planned to store the produce entirely owned by him or on rental basis or in combination of the two. NABARD usually encourages cold storages where 70% of the capacity is available to farmers for storage on rentals. Financial viability of a unit depends upon the intended pattern of use and rental rate prevalent in an area. However, units entirely to be used by the owners are also considered for sanction. Considering 70:30 utilization of the capacity for rentals and own use, a 5000 MT capacity unit is considered as viable with the assumptions as indicated at Annexure II. To set up a 5000 MT capacity cold storage unit although one acre of land may be adequate, it is always better to have two acres of land to take care of future expansions and waste management. While selecting the site care should be taken to select a site at an elevation free from inundation and well connected by road and other communication facilities to both production and consumption centres. The land should be of non agricultural type and the soil at the site should be firm enough to carry the weight of the building and storage racks.

5. Technology

A cold storage unit incorporates a refrigeration system to maintain the desired room environment for the commodities to be stored. A refrigeration system works on two principles:

1. Vapour absorption system (VAS), and
2. Vapour compression system (VCS)

VAS, although comparatively costlier, is quite economical in operation and adequately compensates the higher initial investment. Wherever possible such a system should be selected to conserve on energy and operational cost. However, it has its own limitations when temperature requirement is below 100C and many of the fruits and vegetables except seeds, mango, etc. require lower than 100C for long storage.

VCS is comparatively cheaper than VAS. There are three types of VCS systems available depending upon the cooling arrangements in the storage rooms i.e., diffuser type, bunker type and fin coil type. Diffuser type is comparatively costlier and is selected only when the storage room heights are low. The operational cost of such units are also higher. Bunker type is the cheapest and is preferred when storage room heights normally exceeds 11.5 m. Its operational cost is also low. Fin coil type, although about 5% costlier than the bunker type, is very energy

efficient with low operational cost and higher space availability for storage of produce. Such system is used for units with room heights of 5.4m onwards. A comparison of electrical loads & energy savings, refrigerant requirement and space savings in all the three systems are given in Table 2.

Table 2 : Comparison of energy savings, refrigerant and space requirement of cooling units of a 4000 MT cold storage.

Item	Unit	Type of Vapour Compression System		
		Diffuser	Bunker	Fin coil
Installed Electrical load	hp	180	128	124
Installed Electrical load	kW	134.28	95.49	92.50
Energy saving	%	-	29	31
Refrigerant requirement	kg	1,520	2,200	380
Space requirement for cooling system	cu m	452	670	36

In a refrigeration system, refrigerants are used to pick up heat by evaporation at a lower temperature and pressure from the storage space and give up the heat by condensation at a higher temperature and pressure in a condenser. Freon used to be a common refrigerant but as it causes environmental degradation, its use is going to be banned by the year 2008. Therefore, Ammonia is being increasingly used and preferred for horticultural and plantation produce cold storage units.

Although several types of compressors and condensers are available, medium speed reciprocating compressors and atmospheric condensers are preferred because of the relatively lower cost, energy efficiency and ease in maintenance.

While selecting size of the equipment, care should be taken to assess all loads and proper provision should be made to take care of the peak demand during summer loading and aging of the equipment. Heat load factors normally considered in a cold storage design are:

1. Wall, floor and ceiling heat gains due to conduction
2. Wall and ceiling heat gains from solar radiation
3. Load due to ingress of air by frequent door openings and during fresh air charge.
4. Product load from incoming goods
5. Heat of respiration from stored product
6. Heat from workers working in the room
7. Cooler fan load
8. Light load
9. Aging of equipment
10. Miscellaneous loads, if any

Structural requirement : Although the storage space provision will vary according to the room height and technology being selected. Normally, a provision of 3.4 m³ per MT of potato is considered for finalizing the room size with the bunker type of VCS technology. For other

commodities, space adjustment should be made with relation to their bulk density as compared to potato. Proper soil testing and rack design need to be ensured. The rack system and its foundation should be strong enough to support weight of commodities. Normally, raft foundation is preferred for racks.

Insulation : All the sides of the cold storage room need to be insulated in order to maintain the required temperature inside. Various types of insulating materials are used for insulation of side walls, partition walls, floor and roof. However, the most commonly used insulation material is thermocoal and sometimes Poly Urethane Fibre (PUF) panels are also used for insulation depending upon the economics of the project. Proper thickness of insulating material should be used for insulation of walls. Normally, two layers of insulating material are used for insulation. A minimum 100 mm thickness of low density thermocoal need to be used for sun facing walls and roof, whereas 80 mm thickness of low density thermocoal may be used for other two walls. Partition walls need to be insulated with 40 mm low density thermocoal and a thickness of 80 mm high density thermocoal is necessary for floors.

Utilities : Availability of soft water and dependable power supply at the site needs to be ensured. In case the power available is not dependable, provision of a Diesel Generator set should be incorporated in the project. Similarly if water at site is not soft and its hardness is within the limit for treatment, a softening plant has to be incorporated to match the capacity.

6. Promoter's Profile

The promoters can be individuals, group of individuals, cooperative societies, proprietary/partnership concerns and joint sector companies in public or private sector. While formulating a project, complete details of the promoter(s), their experience in the activity and net worth, etc. have to be incorporated.

7. Physical and Financial Outlay

The following physical provisions with their costs are considered for a cold storage unit:

1. Land
2. Site development including leveling, fencing, road, drainage, etc.
3. Civil structures including main cold storage building, rack provisions, drying shed, machinery room, store for consumables, generator room, office, security cabin, etc.
4. Insulation of main cold store building
5. Machinery for cooling, air movement, loading, grading and weighing
6. Electric supply arrangement including installation of transformer and deposits for requisite connection
7. Standby electric supply arrangement/ DG set
8. Water supply arrangement and treatment plant, if required
9. Pollution control and waste disposal equipment
10. Miscellaneous fixed assets including office equipment and furniture
11. Preliminary and preoperative expenses
12. Contingency

13. Margin money for working capital

Wherever market is there for ice, an ice plant of the suitable size may be incorporated for better utilization of the facilities and higher income. If an ice plant is included with the cold storage, the additional investment for ice plant may also be included in the financial outlay.

The average cost of a 5000 tonnes capacity cold storage is about Rs. 150 lakhs and the tentative expenditure on broad heads is given at Annexure III.

While deciding the physical provisions, care may be taken to make the unit a multi commodity and multi chamber system for better capacity utilization.

8. Financial Viability

The financial analysis of the investment of a cold storage unit of 5000 MT capacity has been attempted and is placed at Annexure IV. The project has a margin money component of 25% with the rate of interest on term loan and working capital as 15% and 18% respectively. The rental charges have been considered at Rs. 700 per MT and the profit margin on self storage is Rs. 3000 per MT. Pledge loan earns a margin of 2%. For this project, the financial indicators of the investment are as under:

1. Net Present Value @ 15% DF = Rs. 67.09 lakh
2. Internal Rate of Return (IRR) = 25.75 %
3. Average Debt Service coverage Ratio = 1.58

9. General Lending Terms

NABARD provides refinance support to various financing banks including Commercial Banks (CBs), Regional Rural Banks (RRBs), State Cooperative Banks (SCBs) and State Cooperative Agriculture and Rural Development Banks (SCARDBs) for financing cold storages under its normal refinance programme. The general terms and conditions relating to the NABARD's refinance support are indicated below:

a. Eligible Borrowers/ Institutions for Refinance

The advances made to individuals, group of individuals, cooperative societies, proprietary/ partnership concerns and joint sector companies by CBs and SCBs for cold storage units chain are eligible for refinance from NABARD. Besides this, the advances granted to individuals for cold storages and allied purposes granted by SCARDBs and RRBs are also eligible for refinance from NABARD.

b. Margin Money

A margin money of 15% to 25% of the project cost is normally insisted upon depending upon the status and financial health of a borrower.

c. Rate of Interest

The rate of interest on the agricultural advances including cold storage and godowns are stipulated by the financing banks subject to guidelines issued by the RBI from time to time. The interest on NABARD's refinance to various banks depends upon the loan amount. The existing interest rate for refinance to various banks is given below:

NABARD's Interest Rates on Schematic Refinance for Farm/ Non Farm Sectors for all agencies vide circular No. 39/DPD.FS.07/2004 dated February 10, 2004

(CBs/PCBs/RRBs/SCBs/SCARDBs/ADFCs) – effective w.e.f. February 13, 2004 {% p.a.}

Loan Amount	For NE States including Sikkim and Andaman and Nicobar Islands	For All Other Regions
up to Rs. 50,000	5.50%	5.50%
Rs. 50001 to Rs. 2.00 Lakh	5.50%	6.25%
above Rs. 2 lakhs	5.50%	6.75%

d. Repayment Period

Repayment period is fixed upon the financial analysis of cash flow for each and every project and in general a repayment period of up to nine years is allowed including a grace period of one year.

e. Security

Security from ultimate beneficiary has to be obtained by the financing banks as per the RBI guidelines issued from time to time.

f. Quantum of Refinance

The quantum of refinance to various financing banks varies depending upon the category of the financing bank. The prevailing quantum of refinance for various agencies are as under:

Agency	Quantum of Refinance
North Eastern Region and Sikkim	
For SCARDBs	95% of the bank loan
For SCBs, RRBs and CBs	90% of the bank loan
All other Regions	
All agencies i.e. SCARDBs, SCBs, RRBs and CBs	90% of the bank loan

10. Capital Investment Subsidy Scheme for construction/ modernization/ expansion of cold storages and storages for horticultural produce

NABARD provides refinance support to various eligible financing banks for financing cold storages under its normal refinance programme, the guideline for which are issued from time to time. A checklist to be used by the bankers for submitting the proposal for refinance is given at Annexure V.

Government of India has sanctioned a capital investment subsidy scheme for construction/ modernization/ expansion of cold storages and storages for horticultural produce. The details of the scheme are placed at Annexure VI. National Bank for Agriculture and Rural Development (NABARD) has been made a nodal agency for promoting the activity through credit delivery system. It has been planned to create an additional capacity of 12 lakh tonnes of new units and rehabilitation of 8 lakh tonnes of closed units under the scheme.

11. Dos and Don'ts

In order to safeguard the interest of the bankers and borrowers, it would be necessary to take certain precautionary measures. As a ready reckoner, some of the important aspects are shown in the form of Dos and Don'ts in Annexure VII for success of the unit.

Annexure I

Desired Storage Environment of Fruits and Vegetables in the cold storage

Commodity	Temperature (oC)	Relative Humidity (%)
Apple	-1 - 3	90 - 98
Apricots	-0.5 - 0	90 - 95
Avocado	7 - 13	85 - 90
Asparagus	0 - 2	95 - 97
Beans, green	4 - 7	90 - 95
Beet root	0 - 2	95 - 97
Broccoli	0 - 2	90 - 95
Black berry	-0.5 - 0	95 - 97
Cabbage	0 - 2	90 - 95
Carrots	0 - 2	90 - 95
Cauliflower	0 - 2	90 - 95
Cherries	0.5 - 0	90 - 95
Cucumber	7 - 10	90 - 95
Brinjal	0 - 2	90 - 95
Grapes	-1 - 1	85 - 90
Lemons	4 - 15	86 - 88
Lettuce	0 - 1	95 - 98
Lime	3 - 10	85 - 90
Mango	11 - 18	85 - 90
Melon water	2 - 4	85 - 90

Orange	0 - 10	85 - 90
Peach	-1 - 1	88 - 92
Potato	1.5 - 4	90 - 94

Annexure II

Assumptions for working out economics of a 5000 MT capacity potato cold storage

1. Capacity utilization : First year - nil, Second year - 80%, Third year onwards - 100%.
2. 70% of the capacity is rented out and rest 30% capacity is used to store potato owned by the promoter(s).
3. Rental charges per season per MT of potato are Rs. 700/-.
4. Marketing margin on own potato considered at Rs. 3000/- per MT.
5. Pledge loan margin of 2% has been assumed on 20% of total handling, considering per ton price of potato at Rs.2500/ MT.
6. Electricity and other utilities expenses considered at Rs. 210/- per MT per annum.
7. Lump sum establishment and office expenses considered as Rs. 2 lakhs per annum.
8. Expenditure on maintenance and repairs considered as Rs. 20/- per MT per annum.
9. Expenditure on gas, fuel and lubricants considered as Rs. 10/- per MT per annum.
10. Labour charges for loading and unloading of potato in the cold store considered as Rs. 15/- per MT.
11. Insurance charges for the potato considered as Rs. 20/- per MT per season.
12. Interest on working capital considered at 18% per annum for six months on an average in a year.
13. Margin money considered at 25% of the financial outlay.
14. Interest on term loan considered at 15% per annum.
15. Even though the life of the cold storage will be much more, the life has been considered as 15 years for working out internal rate of return.
16. Depreciation rate of 5% and 15% has been considered for civil structures and plant & respectively.
17. Repayment period of nine years with one year grace period has been considered. The interest during first year has been capitalized and repayment of principal has been considered from third year.

Annexure III

BROAD TECHNICAL PARAMETERS FOR A 5000 MT COLD STORAGE

Land requirement	2 acres
Storage space requirement	17000 cubic metre
Technology preferred	Gravity circulation/ Bunker type/ Fin-coil
Cold storage room height	12.2 to 18.5 m

Avg. cost of investment	Rs. per MT	Total Cost (Rs. lakhs)
Civil cost	1400	70
Insulation cost	350	17.5
Equipment cost	1100	55
Miscellaneous cost	150	7.5
Total	3000	150
Operational cost	Rs./MT/year	
Electricity & utilities	210	
Establishment expenses	35	
Maintenance and repair	20	
Gas, Fuel and Lubricants	10	
Labour charges	15	
Insurance	20	
Total Electrical load	125 kW	

a) MEANS OF FINANCE

		Rs. (lakhs)
Total Project Cost		150.00
Margin Money	25%	37.50
Term loan	75%	112.50
Rate of Interest on term loan	15%	
Rate of interest on working capital	18%	

(b) INCOME AND EXPENDITURE STATEMENT

(c) CASH FLOW STATEMENT

(d) REPAYMENT DETAILS

(e) FINANCIAL INDICATORS

(f) DEPRICIATION SCHEDULE

(g) TERM LOAN SCHEDULE

ANNEXURE V

CHECK LIST FOR COLD STORAGE PROJECTS

A) General Information	
1	Name ,location and office address of the cold storage unit
2	Project background, area of operations (no. of blocks proposed to be covered and/ or city / market targeted)
3	Population of the area, crops being grown, land holding pattern, area under irrigation.
4	Production of storage commodity in the area .
5	Demand of the commodity in the area.
6	Names of the financing bank(s) / branch(es) and whether the scheme is in their service area.
7	Approval of the scheme/constructions from the competent authority
B) The Project	
1	Objectives of the project
2	Capacity of the project and justification thereof
C) Promoters	
1	Status of the promoters/ company - whether individual/ society/ partnership firm/ private limited company/ public limited company
2	Background of the promoters - educational/ technical/ agricultural/ business and length of experience
3	Financial health of the promoter/s(to be supported with the documents)
4	Competence of the promoter/s for the project
5	Other activities being taken up/ planned
D) Technical Aspects	
i) Availability of commodity	
1	Commodity proposed to be stored
2	Area under the commodity for past five years in the area of operation and production thereof / demand of the product in the target market
3	Projections of the production - consumption figures for next nine years
4	Number of existing cold storage units in the area of operation and their installed capacities.
5	Capacity utilization achieved by the existing units in previous three years and their financial health
6	Proposed pattern of capacity utilization i.e., for self , farmers and traders
7	Contract condition of storage of the proposed commodity with farmers and traders
8	If there is a scope of incorporating an ice plant in the unit , the capacity requirement and details of the unit
ii) Capacity and Location	
1	Locational advantage of the unit
2	Distance from the main market for the commodity
3	Location of the nearest cold storage from the proposed site & its capacity.
4	Details about the site - Area of the plot/ Site plan indicating the existing metalled roads and the natural drainage

5	Copy of the land records clearly indicating the title and cost
6	Distance from the nearest Railway station and existing metallic road
7	Availability and suitability of water for the activity
8	Water test report indicating the hardness of the water
9	Availability of electricity at the site/ Distance from the existing HT line
10	Other communication facilities available near the site
11	Any other consideration for selection of proposed site
12	Status of site regarding use of land for non agricultural purposes
13	Whether clearance has been obtained from Pollution Control Board / competent authorities for constructions, power connection.
iii) Civil Structures	
1	Items proposed under site development and their detailed specifications (storm water drainage systems , roads , boundary walls , quantum of earthwork , gates etc.)
2	Soil test report for load bearing capacity of the soil
3	Details of building clearly indicating the size of each building(L/B/H) and justification for the size
4	Layout plan for the proposed structures indicating existing structures, if any
5	Ambient temperature conditions and Provisions for insulation of the structures - the insulation material ,thickness of the insulation for different walls (side walls, roof and floor) , area and cost of insulation.
6	Design details of racks proposed
7	Provisions proposed for loading/ unloading of proposed commodity in cold storage
8	Arrangements proposed for drying/ sorting/ grading of the commodity before/ after storage and its justification.
9	Analysis of the rates considered for preparing the estimates vis-a-vis rates as per SOR for the area and base year of the SOR.
10	Any other relevant information
iv) Plant and Machinery and Utilities	
1	Type of cold storage technology and justification
2	Tonnage of refrigeration proposed and heat load calculations for the proposed capacity
3	Details of the machines proposed to be procured including their technical specifications and power requirement
4	Criteria adopted for selection of the proposed machinery
5	Stand-by items proposed under machinery and their justification
6	Source of the machinery
7	Total power requirement and arrangement for the same
8	List of essential loads to be connected to the stand-by power arrangement
9	Details of water requirement and proposed source of water
10	Details of the well, pumpset, over head tank and piping works
E) Marketing	
1	Arrangement for procurement of the commodity for storage forward and backward linkages
2	Services proposed to be offered by the unit.

3	Utilization plan of the unit for proposed services
4	Existing rates for different services and their trend for last five years
5	Capacity utilization proposed and justification for the same
F) Organizational Setup	
1	Organization Structure , details of manpower requirement and salary structure
2	Availability of technical manpower
3	Availability of skilled and unskilled labours

G) Financial Information	
(i) Project Outlay	
1	item wise cost proposed under site development and their quantity of work analysis
2	Item wise cost proposed under Civil structures and their quantity of work analysis
3	Item wise details of the cost of machinery with supporting quotations / literature etc.
4	Cost of miscellaneous equipments including office equipments, communication system fire fighting equipment etc.
5	Cost proposed under electrification and item wise cost breakups
6	Cost proposed for stand-by power arrangement
7	Cost proposed for water supply systems such as construction of well / digging of tubewell , installation of pumpset, construction of overhead tank and piping works
8	Any other arrangement / cost proposed may be described with proper details
9	Cost of Erection and Commissioning
(ii) Means of Finance :	
1	Total Outlay
2	Margin Money
3	Loan Requirement
(iii)	Lending terms: Rate of interest, grace period, repayment period, down payment, nature of security, availability of government guarantee for bank loan/ refinance, sources and extent of availability of subsidy etc.
(iv)	Proposed schedule of implementation .Year wise physical and financial programme, bank loan refinance requirement.
(v)	Estimates of unit wise aggregate income, expenditure and surplus from the cold storage, comments on the financial viability of the project along with cash flow, B/C ratio, net present worth, financial rate of return , Internal rate of return and Debt Service Coverage Ratio
(vi)	Assumptions made for calculating income and expenditure statement
(vii)	Income and Expenditure Statement for next nine years
(viii)	Sensitivity Analysis
(ix)	Socio-economic benefits including employment generation and benefits to farmers
(x)	Comments on the financial position of the borrowers/ implementing agency. In case of companies, partnership firm or society an analysis of their financial position and audited financial statements for last three years.
(xi)	Infrastructure available for project implementation
(xii)	SWOT Analysis

Annexure VI

Details of Capital Investment Subsidy Scheme for Construction/ Modernization/ Expansion of cold storages and storages for horticultural produce for the year 1999-2000

1. **Eligible Borrowers :** Partnership firms, cooperative societies, private/ public joint sector companies, Agricultural Produce Marketing Committees, Marketing Boards and Agro Industries Corporations.
2. **Eligible Banks for Refinance from NABARD :** Commercial Banks (CBs and RRBs), Cooperative Banks (SCBs and SCARDBs), ADFCs (Bangalore, Chennai and Hyderabad).
3. **Project Cost :** Depending upon the capacity, technology used for cold storage/ godowns on the basis of actuals/ estimates/ invoices of machineries, etc.
4. **Type of technology :** Preference is given for modern design/ technology and energy saving devices.
5. **Quantum of Subsidy :**
 - The subsidy is available only in States/ Union territories/ Areas which do not administer or control rentals for cold storages and there are no restrictions on the operation of these units.
 - Rs. 1000/ per MT of cold storage/ storage capacity created additionally subject to 25% of the project cost per beneficiary. For calculating subsidy, the capacity of cold storage can be decided by providing a volume of 3.4 cubic meter per MT or 120 cubic feet per MT of storage.
 - As per circular No. 280/ICD-14/2003 dated December 23, 2003, NABARD hence forth will be restricting the payment of subsidy for a maximum capacity of 5000 MT irrespective of the fact whether the capacity created is higher than 5000 MT and the total outgo of subsidy is within Rs. 50.00 Lakh.
 - The sanction of subsidy under the scheme is subject to availability of funds, the instructions/ guidelines issued by GOI from time to time.
 - Subsidy would be released to the financing bank on submission of completion certificate by the borrower through the financing bank. The subsidy will be kept in separate account by the financing bank and the repayment schedule will be drawn on the loan amount (including subsidy) in such a way the subsidy amount is adjusted after the bank loan portion is liquidated.
6. **Margin Money :** 15% to 25% of the project cost depending upon the status of the

borrower.

7. **Term loan for financing banks/ Institutions (ADFCs) :** Balance amount (including subsidy, where available)
8. **Rate of interest to be charged from the borrower :** Size of limit Commercial Banks/ RRBs SCBs/ SCARDBs

Size of Limit	Commercial Banks	SCBs/ SCARDBs
For loans upto Rs. 2.00 Lakh	Not exceeding PLR of the bank	Not exceeding PLR of the convener bank of the state level bankers committee (SLBC) of the concerned state
For loans above Rs. 2.00 Lakh	Not exceeding 1.00% p.a. above PLR of the bank	Not exceeding 1.00% p.a. above PLR charged by the sponsor bank of the state level bankers committee (SLBC) of the concerned state

9. Rate of interest on refinance amount to be charged to financing bank : from 5.50% to 6.75% p.a. depending upon the loan size

10. Quantum of Refinance : 90% of the amount financed to borrower (including subsidy)

11. Repayment period : Depending upon cash flow and will be upto 9 years including a grace period of two years.

12. Other Conditions : The terms and conditions as applicable to project lending by financing banks and / or refinance by NABARD including the technical feasibility and financial viability are applicable to the projects under the scheme. The borrower/ financing bank/ shall furnish the project report in respect of the scheme as prescribed by GOI/ NHB/ NABARD for the purpose of monitoring and physical checking of projects.

Annexure VII

Dos and DON'Ts

Sr. No.	Dos	Don'ts
1	Suitability of site with proper elevation, drainage and linkages by road and other communications must be ensured.	Site in a low lying area with poor road and other communication linkages must be avoided.
2	Land should be converted to non agricultural category.	Agricultural land should not be used for construction of cold storage without converting it to non agricultural category.
3	Soil should be tested for its load bearing strength and matching rack design should be adopted.	Do not avoid soil load bearing test and proper rack design.

4	Necessary permission from local authorities for construction of cold storage should be obtained.	Don't avoid taking permissions from local authorities for constructions.
5	Capacity of the plant and its room temperature should be matched to the product to be stored and market size.	Don't select the capacity of the cold storage arbitrarily.
6	Selection of technology and machinery should be for power efficiency, low investment and maintenance cost.	Costly and energy intensive technology should be avoided.
7	Plant operation may be planned in a manner to not exceed an average 12 hours operation a day.	Plant operation for more than 12 hours a day should be avoided.
8	Refrigeration system should be properly pressure tested and vacuum tested for safety.	Proper pressure testing and vacuum testing of the refrigeration system should not be over looked.
9	Soft water should be used for plant operation.	Don't use hard water without softening it.
10	Trained personnel should be employed for operating the plant and maintaining desired room conditions.	Untrained and inexperienced personnel should be avoided for critical plant operations.
11	Proper standby equipment like compressor with motor and water circulation pump should be provided.	Standby provisions for critical equipment should not be avoided to save on cost.
12	Assured electricity supply matching to the electrical power requirement should be provided. In case of power failures, the supply should be ensured by DG set matching to the essential power requirement of the unit.	Don't compromise on DG set to ensure assured power supply.
13	Proper safety provisions like fire extinguishers and safety alarms should be provided.	Don't compromise on safety aspects for risk free operation of the unit.
14	Proper insurance cover should be taken for building, plant and machinery and stored stocks to take care of unforeseen risk.	Don't avoid insurance cover to save on operational costs.