

HARIHAR RENEWABLE PROJECTS

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Techno-Economic Study on Solar cold storage

A revolution in agriculture-

The solar cold storage system is a revolution in the area of agriculture. The farmers can store the perishable produce for some time before selling it in the market for higher price. As per recent estimates the fruits and vegetables worth Rs.30,000 Crores are spoiled every year due to non-availability of cold storage facilities.

A 50 Ton cold storage is the minimum unit size to make the economic storage of fruits and vegetables. The size of the enclosure shall be 25ft x 25ft x 12 ft. It can be made of bricks structure or the PUF panels. The ground size requirement is minimum 100 sq yard. Other sizing criteria is as follows.

Cold storage capacity- 50 tons of fruits & vegetables

Temperature required- 5deg C for Potato etc, 28 deg C for onions

Ac systems required- 2 tons x 2 units.

Power requirement- 5kw load

Solar system- required- 20KW

Capital costs-

Building etc- Rs.8 lacs

AC system- Rs.2 lacs

Solar system (off grid)- Rs.15 lacs (including batteries)

Diesel generator (emergency)- Rs. 0.5 lacs

Total fixed investment- Rs.25.5 Lacs

Operating cost-

Initial Vegetable filling 50 tons of potato- Rs. 3 Lacs

One operator cum care taker- Rs. 1 Lac/ year

Economic cycle-

Fill potatoes in Feb @Rs.6 /kg - Rs. 3 Lacs.

Unload in May @Rs.15/Kg- Rs.7.5 Lacs,

gain= Rs.4.5 lacs

Load Onion and Garlic in June @ Rs.6/kg- Rs.3 Lacs

Unload onion and garlic in Oct @ Rs.20/kg- Rs.10 Lacs

gain Rs. 7 Lacs

Load partly Fruits like Apples @ Rs. 40/kg, orange @20/kg- Rs. Rs.5 lacs

Unload fruits in Jan @ Rs. 80/ apple kg, @40/kg orange- Rs.10 Lacs **Gain Rs.5 Lacs**

(If we fill full fruits in 50 tons- filling cost Rs.15 lacs and gain is also Rs.15 Lacs)

Total gain per year- Rs.19.5 Lacs (Rs.29.5 Lacs for full fruits filling)

Operating cost- Rs.3.5 Lacs (one care taker and O&M costs)

Net gain- Rs. 16 Lacs (26 lacs for full fruits)

Return on investment- $16/(25.5+3)= Rs.56\%$ (100% for full fruits storage)