



Solar Based Cold Storage

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Abstract: The history of agriculture in India dates back to the Indus Valley Civilization. India ranks second worldwide in farm outputs. As per 2018, agriculture employed more than 50% of the Indian work force and contributed 17–18% to country's GDP. The total agriculture commodities export was US\$3.50 billion in March - June 2020. India exported \$38 billion worth of agricultural products in 2013, making it the seventh largest agricultural exporter worldwide and the sixth largest net exporter. Most of its agriculture exports serve developing and least developed nations. Indian agricultural/horticultural and processed foods are exported to more than 120 countries, primarily to the Japan, Southeast Asia, SAARC countries, the European Union and the United States. Estimates place post-harvest food wastage due to inadequate cold storage at 40% (Desai, October 2011) for fruits and vegetables alone without including dairy produce and food grains. This has a bearing on India's contribution to the world with regard to international food trade as although the country is self-sufficient, the export volume is comparatively low (Alam, 2006). The Ministry of Food Processing in India identified the cold chain to be a weak link in the food processing sector. There exists much room for improvement in the cold storage and integrated cold chain infrastructure with regard to both capacity and operation. (MoFPI, Government of India, 2010). India is developing and while electrification is considered a top priority by the planning commission, there are still a great number of villages that are still to be electrified. Even the ones that are electrified have unreliable power (Gopal & Suryanarayana, 2011). This is a challenge with regard to the energy required for refrigeration of food produce. Hence, there exists a pressing need to develop a smaller capacity refrigeration system which can be operated independent of the electrical grid. This thesis is an investigation into the methods of refrigeration that can be adopted for the purpose of reducing food produce wastage. Specific focus on solar based refrigeration is placed due to the tropical position of the country that ensures adequate delivery of solar energy through the year.

Keywords: Sunlight, Cold Storage, Renewable Energy, Mobile Storage.

REFERENCES

- [1]. Dr Satish C. Jha 'Bihar's' Agriculture Development
- [2]. A Kumar (2012) TERIN webpage (online) available.
- [3]. Emerson Climate Technologies.
- [4]. www.iitgate.com