CHILDREN'S INVESTMENT FUND FOUNDATION

SHEETAL
Alliance for Sustainable Habitat, Energy Efficiency and Thermal Comfort for All

Alliance for an Energy Efficient Economy

ANALYSIS OF POTATO VALUE CHAIN IN WEST BENGAL

Roadmap for retrofitting-cum-modernizing existing cold storages

About the Report

"Analysis of cold storage infrastructure in West Bengal- Retrofitting opportunities in the ESCO model" was developed under the Alliance for Sustainable Habitat, Energy Efficiency and Thermal Comfort (SHEETAL) project, in collaboration with Energy Efficiency Services Limited and funded by Children's Investment Fund Foundation (CIFF). The report presents West Bengal's cold storage scenario, identifying the potential opportunities by modernising and retrofitting cold-storages to reduce food loss, improving energy performance baseline and developing the state-level energy-saving projection. In addition, the report recommends the way forward for policy and technology for large-scale implementation of the proposed retrofitting and modernisation.

Background: Potato Value Chain in West Bengal

West Bengal is an agricultural economy employing 44% of its workforce in the agriculture sector. It is the second-largest horticulture producing State in India, after Uttar Pradesh. Among the horticulture crops, potato plays a vital role in the agricultural economy of West Bengal. It is a Rabi potato producing state where the sowing period is from mid-September to November, and the crop is harvested from December to March. Around 13.4 million metric tonnes (MT) of potatoes were produced on 4.5 lakh hectares of land in West Bengal during TE2018-19. The major potato growing districts include Hooghly, Burdwan, Bankura and Medinipur. Many intermediaries such as village traders, cold storage owners, commission agents, wholesalers, and retailers are involved in the potato supply chain from the production of potatoes until it reaches the final consumer. Generally, the farmers cannot sell their potato produce directly to the wholesalers and thus sell it to the village traders near the wholesale markets. On average, a farmer in West Bengal

Key Facts about Agriculture in West Bengal

- Dominated by Small and Marginal Landholding
- Agriculture Households' Income EUR 140 i.e 1/3 of all India Avg - EUR 435
- Second Largest Horticultural Producing State
- Potato is a major Horticultural Crop Stands 2nd with 1/4 of India's Total Potato Production
- 90% of 500+ Cold Storage in the State are used for Potato

earns INR 5 by selling 1 kg of table variety of potatoes. In contrast, the farmgate prices of 1 kg of processed variety of potatoes in Gujarat are INR 9.65/kg. From 2015 onwards, many food processing industries have shifted their base from West Bengal to Gujarat due to factors like the quality of potatoes and the starch ratio in the potatoes produced.

The potatoes are stored in the cold storages in West Bengal before the consumers ultimately consume them. There were 514 cold storages in West Bengal in August 2020, of which 90% (463 cold storages) are used for storing potatoes. The average capacity of potato cold storage in West Bengal is around 11,000 MT. The loading of potatoes in cold storages starts towards the end of February and closes by March-end, whereas the unloading starts from May/June onwards and goes on till the end of the storage season in November.

During the peak season, 100% of the cold storage capacity is utilised to store potatoes, but as the unloading starts, the cold storages capacity utilisation also starts decreasing. Currently, the storage rate in West Bengal is INR 157/quintal/season.

Losses of potatoes also occur during the intermediation process before it reaches the final consumers. Temperature, humidity, and air movement can affect the stored potatoes' quality during the storage process. Overall, 27-30% of the losses occur in the supply chain of potatoes in West Bengal. In 2019-20, of the 13.16 million MT of potatoes produced in the State, 4.37 million MT were consumed by the domestic consumers, 6.79 million MT were exported to the other states, and the remaining 2 million MT was lost during the intermediation process.

Post – Harvest Losses in the Supply Chain of Potatoes in West Bengal

Key Findings

The percentage of losses in traditional cold storage is much higher than the losses in modern cold storage. Overall, it is estimated that retrofitting-cum-modernization of the existing traditional cold storages in West Bengal can lead to a 75% loss reduction. Due to the lack of modern cold storages, monetary losses of more than INR 200 crore occurs every year in West Bengal. A sudden increase in the monetary losses to INR 599 crore in 2020 can be due to a sudden rise in potatoes' wholesale prices.

Detailed energy audits of three types of cold storage facilities located in the Hooghly district of West Bengal were carried out to understand the potato handling, storage practices and energy utilisation. It was observed that with traditional bunker coil systems and single chamber designs, the desired air circulation, temperature and humidity conditions are challenging to maintain. Infiltration losses are commonplace due to leaky building envelopes. The average unit rate of electricity purchased from the Grid varies from INR 7 to 8 per kWh among the audited facilities. More than 90% of the energy expenditure was attributed to the electricity grid.

Standardised Energy Efficiency Measures (EEMs) have been assessed and proposed to improve the cold storages' overall energy performance while retaining the product quality. A cost-benefit assessment of the EEMs was carried out with audit data in consultation with leading industry players. Additionally, the report analysed the state-level energy-saving potential, investment potential, and the monetary benefits from potato loss reduction through the modernisation of potato cold storages in West Bengal. It is estimated that around 3.6 lakh MT of potato losses can be avoided through the modernisation of cold storages, which will lead to a monetary benefit of INR 566/crore/year.

Way Forward

The State has vast growth potential in the horticulture sector, requiring a shift from cold storages to integrated cold chains to realise its full potential. Modernisation of the existing traditional cold storages into multi-purpose cold storages will be the right first step, incentivising diversification of the cropping pattern bringing new avenues of growth for the farmers. The modernisation will also help to maintain the potatoes' quality and minimise the post-harvest losses. Moreover, it will help the farmers to realise a more significant economic value for their produce and boost their income.

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