



GROWER EXTENDS REACH AND EXPANDS MARKETS THANKS TO CARRIER'S COLD CHAIN EXPERTISE

Carrier spearheaded a cold chain demonstration with a kinnow grower in northern India to measure the impact of cold storage and refrigerated transport on extending shelf-life and expanding sales to new domestic and export markets. The project showed how the cold chain is a game-changer, increasing profitability by up to **23%**, reducing post-harvest food loss by **76%** and CO₂e emissions by **16%**, and opening up exports to **10** countries.



Kinnow is a small citrus fruit rich in micronutrients that is grown in the Punjab region of India and Pakistan

PRE-DEMONSTRATION

Kinnow was traditionally transported using open trucks and sold mainly in local outdoor markets in the Punjab region. In fact, most of India outside the Punjab had never seen or tasted a kinnow.

Kinnow was available only **2-3 months** a year



Kinnow is best kept at **4-5°C** and relative humidity of **85-90%**

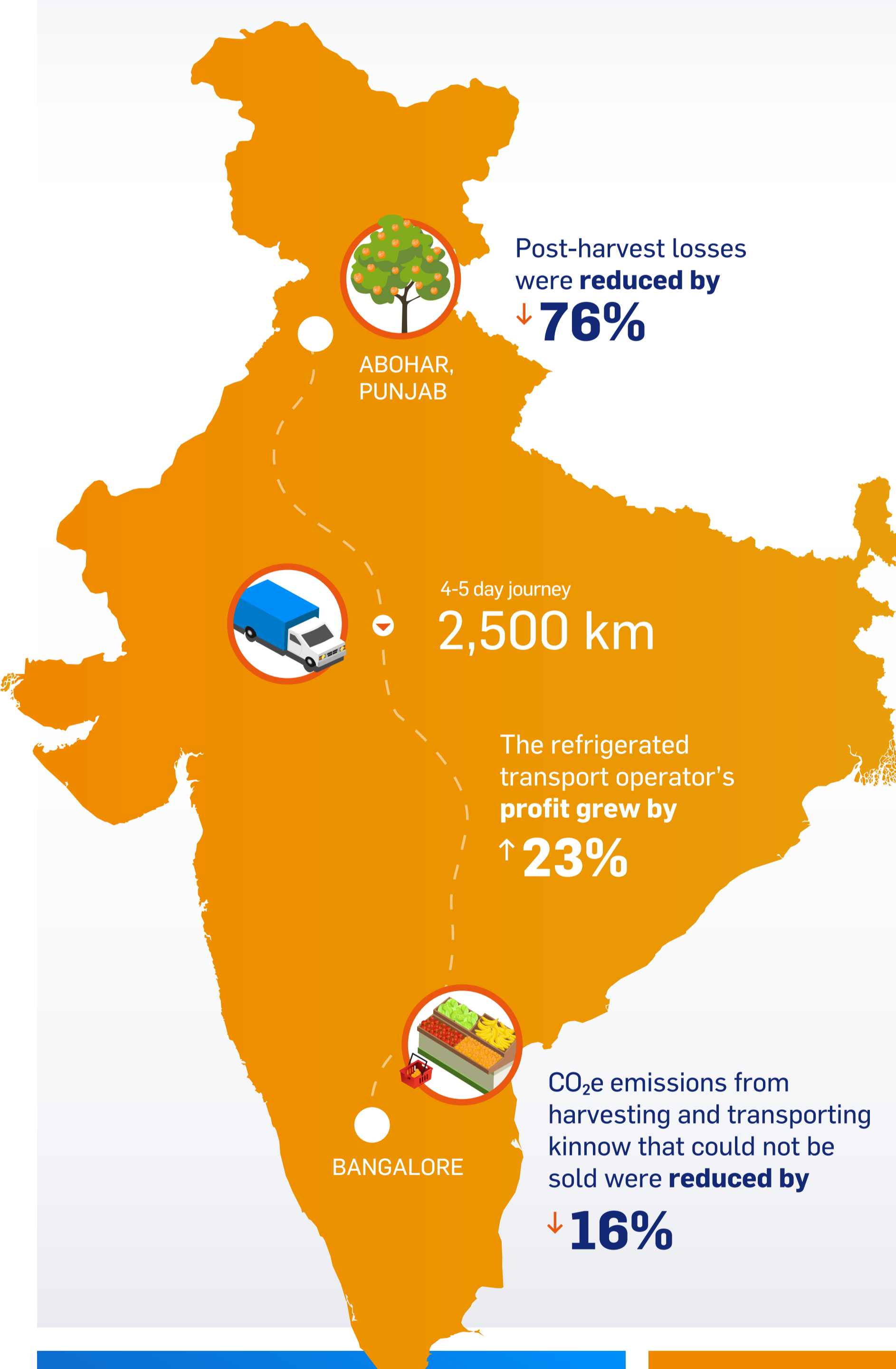
📍 Abohar 12-15°C*

📍 Bangalore 20-30°C*

*During kinnow growing season

Growers typically sustained post-harvest losses up to

32%



RESULTS

Investment in pre-cooling and transport refrigeration equipment reduced food loss **by 76%** and CO₂e emissions **by 16%** while increasing the grower's profitability **by 15%** and extending the selling season to **4-5 months** a year



REACH

The connected cold chain has allowed kinnow to be exported for the first time, to countries such as:

- Bahrain
- Bangladesh
- Kuwait
- Oman
- Russia
- Saudi Arabia
- Sri Lanka
- Ukraine
- United Arab Emirates
- United Kingdom



We earn higher profits if the kinnow market is extended beyond March. The quality of kinnow received in refrigerated trucks is much better than the quality received in open-air trucks. The price differential reflects the same."

- Mr. Kamal Arora
IG International Distributors, Bangalore

PAYBACK

The participating grower, Balaji Fruits, saw payback periods of



2 years Pre-cooling equipment



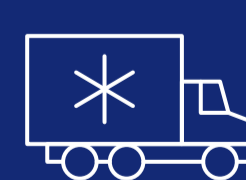
4 years Refrigerated trucks



Pre-Pilot Today

0 → 10

PRE-COOLING UNITS



Pre-Pilot Today

0 → 400

REFRIGERATED TRUCK TRIPS



Pre-Pilot Today

0 → 10

EXPORT COUNTRIES