Cold chain

UK-India centre for sustainable postharvest management and cold-chain

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Food industry

- ~1/3rd of perishable products requires refrigeration
- 6,300 million tonnes global food production
  - ~400 million tonnes preserved using refrigeration (in chilled and frozen state)
  - ~2,000 million tonnes requires refrigerated processing
- India - less than 4% of the country’s fresh produce transported under low-temperature conditions, >90% in the UK
- 20-30% food loss due to lack of refrigeration (average: 9% in developed countries, 23% in LICs)
- ~30% food waste in developed nations
- Food industry about 3% of total electricity (3-3.5% of emissions)

(IIR, 29th Informatory Note on Refrigeration Technologies / November 2015 The Role of Refrigeration in the Global Economy)
Issues, India

- Large number of small farms, low income
- High levels of food loss (~30%)
- Farmers need to see benefits of cold chain technologies
- Focus on money and not energy or carbon
- Often missing links in chain (e.g. pack houses but limited refrigerated transportation)
- Lack of integrated cold chains and architecture in cold chains (direct connectivity from farm-gate to final markets)
- Refrigerants, phase down of refrigerants (Montreal and Kigali)
- Training and skills
- Standards and regulations (in particular needed by large companies when entering market)

- Opportunity to by-pass transitional issues that have occurred in other countries
- But not just to impose solutions which may not be optimal for local conditions
## Need for cooling in cold chain, India

<table>
<thead>
<tr>
<th>Cold-chain Component</th>
<th>Requirement</th>
<th>Created</th>
<th>Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pack-house (MT)</td>
<td>11,21,274</td>
<td>3,984</td>
<td>97%</td>
</tr>
<tr>
<td>Cold storage (Bulk) (MT)</td>
<td>3,41,64,411</td>
<td>31,823,700</td>
<td>9%</td>
</tr>
<tr>
<td>Cold storage (Hub) (MT)</td>
<td>9,36,251</td>
<td>81,200</td>
<td>91%</td>
</tr>
<tr>
<td>Reefer transport (MT)</td>
<td>4,94,608</td>
<td>72,000</td>
<td>85%</td>
</tr>
<tr>
<td>Ripening chamber (MT)</td>
<td>91,306</td>
<td>8,120</td>
<td>91%</td>
</tr>
</tbody>
</table>

Cold-chain – Current Infrastructure & Gap (NCCD, 2015)
Market growth, India

INDIA COOLING ACTION PLAN. Ozone Cell, Ministry of Environment, Forest & Climate Change Government of India, March, 2019
Refrigerants, India

Montreal Protocol on Substances that Deplete the Ozone Layer: HFC Phase-down Schedule for Article 5 Parties

Kigali Amendment to the Montreal Protocol: HFC Phase-down Schedule for Article 5 Parties
**CoE**

- **Vision:**
  - Advice/consultancy
  - Demonstration
  - Design
  - Training
  - Assessment of food quality and safety
  - Business advice
  - Aligned with cultural and local needs

- **CoE**
  - Fixed centre plus outreach to villages
  - Processing hall
  - Quality/safety lab
  - Training facilities
  - Access to team of experts
  - Business incubator
  - Links between cold chain actors

- **Outreach**
- **Processing facilities**
- **Food quality and safety lab**
- **Market data**
- **Design help**
- **Business advice**
- **Training**
What needs to be achieved

- Increase farmers income
- Provide long term sustainable realistic and practical solutions to cold chain issues
- Prove the benefits of technologies and processes
- Improved integration throughout cold chain
- Develop sustainable business models
- No increase in carbon or other emissions
- Move to low GWP refrigerants
- Optimise use of resources
- Up skill the cold chain

- Please discuss involvement in the CoE with us
For further information:

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