



Strengthening Policies and Investment for Clean and Efficient Cold Chain in Bihar

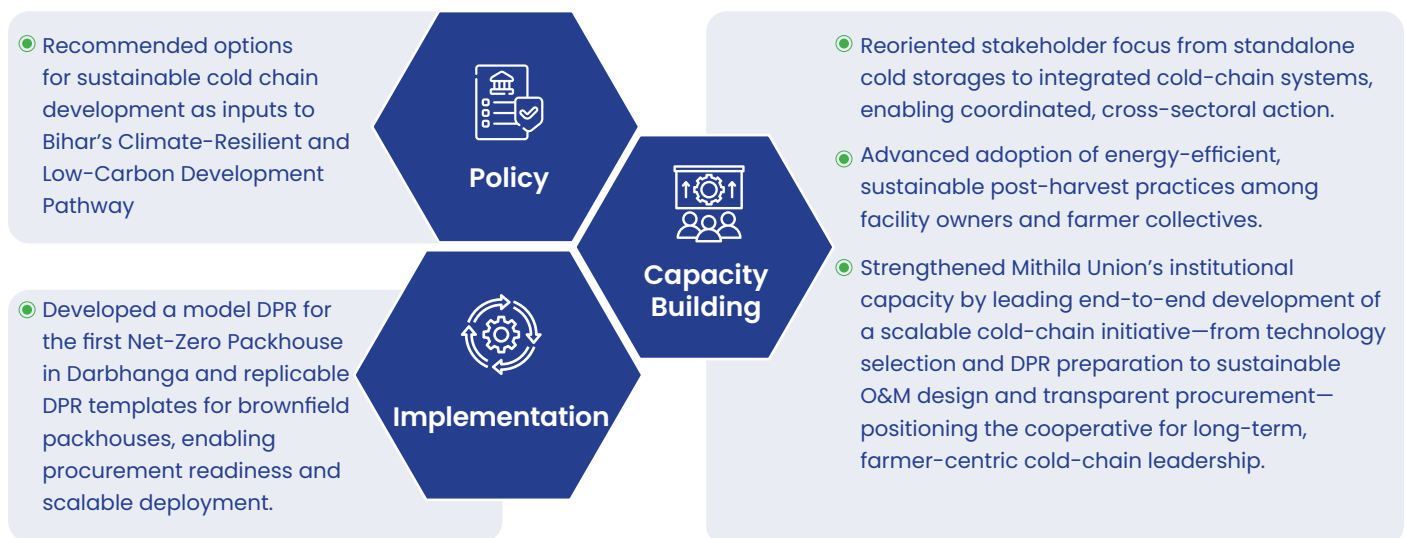
United Nations Environment Programme (UNEP) Cool Coalition in partnership with the Alliance for an Energy Efficient Economy (AEEE), launched the India Cold-Chain Support Programme (ICCP) to accelerate sustainable, integrated cold-chain adoption across India. The initiative supports national priorities, including Doubling Farmers' Income and implementing the India Cooling Action Plan (ICAP).

Bihar's horticulture landscape

Bihar, a leading horticulture state producing over 22 million MT annually, loses 30–40% of its harvests due to weak cold-chain infrastructure, poor handling, and rising climate stresses. With more than 90% of farmers being smallholders, limited capital forces distress sales and deepens vulnerability. The cold-chain ecosystem remains fragmented and largely potato-centric, with major gaps in packhouses, reefer transport, and ripening facilities, and only 64% of cold storages functional as of 2017—highlighting the urgent need for sustained investment in sustainable, climate-resilient cold-chain development.

Program Impact

ICCP program was successful in creating an ecosystem level shift towards advancing sustainable cold-chain infrastructure in Bihar and led the development of the first net zero packhouse in Bihar equipped with energy efficiency measures, zero GWP natural refrigerant and renewable energy.



Projected Impact through establishment of a net zero energy packhouse

- Annual avoided loss of F&V through approx. - 410 MT
- Annual avoided emissions (food loss, and electricity) - 370 tCO₂e
- Direct employment through the deployment - 50
- Directly benefiting community - based group - 10000- 15000 farmers and indirectly benefiting - 20000 farmers



ICCP journey:



Baseline Assessment 2021-22

Mapped horticulture production and cold chain infrastructure

Identified key state actors

Studied policy and institutional landscape

Conducted cold chain facility analysis

Launched the programme with 70+ participant, chaired by the DoH, bringing together key stakeholders from government, industry, and implementation partners

- Identified a significant gap in cold chain infrastructure across the state, particularly in packhouse facilities (Estimated requirement of ~ 1,600 packhouses)
- Recognised the need to modernise existing cold chain facilities.

Suggested recommendations on cold chain in the State's Climate Resilient and Low Carbon Development Pathways report which was sent for Cabinet Approval (**Feb 2025**)



Developed and Implemented strategies to optimize and operationalize government - supported packhouses (Pre-bid process, potential business models: Build Own Operate Transfer, Build Lease Operate Transfer, Participatory & Hybrid O&M models, Conducted market sounding meetings to explore potential operators)

On-ground support 2023-24

Assessed 7 mango and litchi Farmer Producer Companies

Developed DPR templates for green field and brown field packhouses

Conducted pre-feasibility study of 5 agripreneurs for model packhouse development

Litchi & Mango Guidelines





Stakeholder Engagement 2022-25

Held focused group sessions and one on one interaction with key stakeholders to advance sustainable cold chain development.

Provided global platform to state cold chain champions convened by Clean Cooling Collaborative in 2023

Identified state champions



Dept. of Cooperative



Dept. of Agriculture



Directorate of Horticulture



Dept. of Industries



Dept. of Environment, Forest and Climate Change



VEGFED



JEEVIKA



SIDBI

Supported State Departments 2022-25

Conducted workshop on sustainable packhouses in collaboration with SIDBI (70+ participants) (Dec 2024)

Engaged with financial institutions and government entities for project financing (Oct-2024)



Supported Mithila Union 2024-25

Selected Mithila Union as a project partner

Developed DPR (site selection, sustainable technology options and their financial feasibility)- closely working with Mithila Union

Handheld Mithila Union on aspects related to procurement and deployment

Mithila Union submitted final DPR to the Dept. of Cooperatives (Sep 2025)

Onward journey to build, replicate and scale the net-zero packhouse for the larger VEGFED's 50,000-member network.



Key Challenges

Challenge Area	Specific Challenges	Impact
Institutional Coordination and Engagement	<ul style="list-style-type: none"> Delays in approvals, and formal acknowledgements. Frequent changes in departmental leadership disrupting continuity. Difficulty aligning multiple state agencies towards a common roadmap. 	<ul style="list-style-type: none"> Slows decision-making and project implementation. Reduces continuity and hampers long-term planning. Fragmented efforts prevent development of cohesive, state-wide cold chain networks.
Limited Data and Ground-Level Information	<ul style="list-style-type: none"> Lack of reliable baseline data on existing packhouses, utilisation, and supply-chain gaps. Insufficient crop-wise and district-wise information for feasibility studies and DPRs. Need for repeated field visits to validate assumptions. Limited stakeholder willingness to share data. 	<ul style="list-style-type: none"> Hinders evidence-based planning and resource allocation. Increases project costs and timelines due to repeated field validation. May result in inefficient or mismatched infrastructure development.
Financial Barriers	<ul style="list-style-type: none"> FPOs and cooperatives have low creditworthiness. Strict eligibility criteria limit access to loans. High perceived risk of agri-sector lending results in limited buy-in from financial institutions. 	<ul style="list-style-type: none"> Delays procurement of cold chain equipment and infrastructure. Limits scalability and replication of integrated cold chain solutions. Greater reliance on government subsidies rather than sustainable financing.



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Through the project *“Scaling up Investment for Clean and Efficient Cold Chain in India,”* the programme provided strategic and technical support to government agencies, FPOs, industry, and financial institutions to advance climate-smart and commercially viable cold-chain solutions.



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