



# FROM FARM TO FORK: ACCELERATING ACCESS TO SUSTAINABLE COLD-CHAIN IN INDIA

The United Nations Environment Programme (UNEP) has established a new **National Cold-Chain Support Programme** to accelerate the deployment of sustainable and integrated cold-chain systems in India, support the implementation of India's Cooling Action Plan (ICAP) and the achievement of the national target of Doubling Farmers Income by 2022.







## THE CHALLENGE

Agriculture is a critical pillar of India's economy, contributing close to 20% of GDP<sup>1</sup> and providing livelihood to 44 percent of the population<sup>2</sup>. Cold chain helps maintain the quality, nutritional value and safety of food products thereby extending the marketable life of fresh produce and mitigates food loss.

And yet, access to this vital infrastructure is still largely out of reach with only an estimated 4%<sup>3</sup> of the country's produce benefiting from cold-chain.

The implications are wide-ranging: lack of cold-chain holds back rural development, farmers' incomes and export growth, impacts food security and malnutrition and is responsible for high levels of post-harvest food loss and associated emissions.

At the same time, existing and new cold-chains need to be better integrated and incorporate clean and efficient technologies to further increase resilience and climate benefits.

While the Government of India has identified investment in sustainable cold-chain logistics as a vital component of its target of doubling farmers' incomes by 2022<sup>4</sup> and delivering on the ICAP, significant challenges for the implementation of sustainable cold-chain remain. These include limited access to government policies and schemes, low awareness among relevant stakeholders, lack of financial support and participatory business models.

**AN ESTIMATED 30% OF FRUIT AND VEGETABLES ARE LOST OR WASTED EACH YEAR<sup>5</sup>**

**TOTAL POST-HARVEST FOOD LOSS EQUIVALENT TO AROUND INR 14 93,000 CRORE ANNUALLY**

**IN INDIA 190 MILLION<sup>6</sup> PEOPLE STILL GOING HUNGRY EVERY DAY**

**ONLY 1% OF INDIA'S HORTICULTURE PRODUCE IS EXPORTED<sup>7</sup>**

**FOR SOME PRODUCE, FARMERS CAN RECEIVE ONLY A TENTH OF THE RETAIL PRICE**

**THERE IS A 99% GAP IN PACK-HOUSES, 85% IN REEFER VEHICLES, AND 91% IN RIPENING CHAMBERS<sup>8</sup>**

<sup>1</sup> Ministry of Statistics and Programme Implementation, 2014. Key Indicators of Situation of Agricultural Households in India.

<sup>2</sup> International Labour Organisation, 2021. Employment in Agriculture (%).

<sup>3</sup> Birmingham Energy Institute, 2017. Doubling Farmer's Income through clean cold chain.

<sup>4</sup> Niti Aayog, 2017. Doubling Farmer's Income: Rational, Strategy, Prospects, and Action Plan.

<sup>5</sup> Ministry of Agriculture & Farmers' Welfare, 2018. Report of the "Committee on Doubling on Farmer's Income" - Volume III

<sup>6</sup> FAO, Food Security and Nutrition in the world, 2021.

<sup>7</sup> Department of Agriculture, Cooperation & Farmers' Welfare, Horticulture Statistics Division. 2018. "Horticulture Statistics at a Glance."

<sup>8</sup> NCCD, 2015. All India Cold-chain Infrastructure Capacity Assessment of Status & Gap



## THE SOLUTION

Cold-chain expansion requires targeted and cross-cutting support to accelerate development of an integrated system that is connected from farm-to-fork and boosts farmers' incomes without increasing emissions from energy and refrigerant use.

The Cold-chain Support Programme will help national government and states mainstream efficient, renewable, climate-friendly cold-chain infrastructure and services for horticulture in rural areas.

## THE PROGRAMME WILL PROVIDE SUPPORT ACROSS FIVE MAIN ACTIVITY AREAS:

1. Develop packhouse design guidelines with the Bureau of Energy Efficiency and contribute to the implementation of the Indian Cooling Action Plan (ICAP).
2. Deliver low-carbon, circular, equitable, and integrated horticultural cold-chain demonstration projects including integration with health cold chain and rural energy access efforts.
3. Develop and test new participatory business models for cold-chain and expand through a new investment program under EESL focused on high-efficient and renewable cold-chain
4. Develop cold-chain plans in selected states covering infrastructure planning, policy, finance, and capacity building that can be integrated into existing state plans and replicated.
5. Support awareness raising, capacity building and knowledge management, including through Indian Centres of Excellence for cold-chain linked to global and local expertise and learnings.

## ACCELERATE ACCESS TO SUSTAINABLE COLD CHAIN: GET INVOLVED

For more information, please visit:

<https://coolcoalition.org/pilot-projects/india/>



To register your organisation's interest in this program, please email [unep-coolcoalition@un.org](mailto:unep-coolcoalition@un.org)





## TRANSFORMING BIHAR WITH CLEAN AND EFFICIENT COLD-CHAIN

Bihar is the third largest Indian state by population and is primarily an agricultural state, with 80% of the rural population engaged in agricultural practices. Bihar is endowed with rich, fertile agricultural land, a subtropical climate, and vast potential to grow horticultural crops. It is currently the country's fourth largest vegetable producer and the eighth largest fruit producer. Bihar's diverse horticultural production includes numerous crops that can benefit from cold-chain, such as mango, litchi, okra and brinjal.

However, today Bihar is unable to fully leverage the potential of its produce due to numerous cross-cutting barriers. These include underdeveloped cold-chain, processing and road infrastructure; extreme weather events; unreliable power; and finance; and limited marketing of produce. These barriers have led to rural poverty, insufficient nutrition, and labour migration across the state. The situation is particularly precarious for smallholders, which make up 90% of farmers, given their very low incomes and that they are often forced to sell produce well below market rate.

## DEVELOPING COLD CHAIN

Bihar's lack of robust cold chain infrastructure is holding back rural economic development. The social and environmental impacts are significant, high-level analysis by UNEP and AEEE shows that between 2-4 million tonnes of fruit and vegetables may be lost in the state post-harvest, causing 5-10MtCO<sub>2</sub>.eq of emissions annually.

According to the National Centre for Cold-Chain Development (NCCD), 2,205 packhouses are needed in the state, compared to fewer than 30 available today<sup>9</sup>. Similar growth is required in ripening chambers and refrigerated transport, while cold storage capacity will need to triple from current numbers. At the same time, collective awareness of the need for and benefits of a sustainable food cold-chain is limited and there is little involvement of the banking sector in financing infrastructure.

## ACTIVITIES IN BIHAR

The Cold-Chain Support Programme will help the State Government of Bihar, including Department of Agriculture and Directorate of Horticulture, to accelerate development of sustainable, market-linked and integrated agricultural cold chain. This collaboration will include:

1. **Assessment of existing cold chain facilities**, food loss, barriers and cold-chain infrastructure gap and **development of detailed recommendations** to existing cold chain facilities to scale business, improve energy efficiency, use renewable energy and low-GWP refrigerants.
2. **Evaluation of benefits of cold-chain expansion** for rural development and climate change mitigation and adaptation.
3. Development of a **packhouse demonstration project and investment plan** with state government, EESL and local stakeholders testing technology, innovative business model and financing.
4. Supporting the **improvement of coordination** between existing state-level policy framework for cold-chain and financing mechanisms.
5. Provide **dedicated training** to wide variety of local stakeholders on cold chain including project development and financing.

**THE COLD-CHAIN SUPPORT  
PROGRAMME IN BIHAR WILL  
RUN FROM 2022 TO 2025.**

**IF YOU ARE INTERESTED TO  
COLLABORATE WITH PROJECT PARTNERS  
ON THESE ACTIVITIES, PLEASE EMAIL**

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<sup>9</sup> NCCD. 2015. All India Cold chain Infrastructure Capacity (Assessment of Status and Gap).